



“My Food is My Medicine, My Medicine is My Food”

**First Nations and Metis
People of Grey and Bruce: a
forage into traditional food
use, climate change and
health.**

Acknowledgements

This report was prepared for the Grey Bruce Health Unit by Krista Youngblood, Master of Public Health Graduate Student, University of Waterloo, Ontario, Canada. The practicum placement was supported by a grant from the Canadian Institute of Health Research.

The views expressed in this report are those of the Author and not necessarily represent those of the Grey Bruce Health Unit, the University of Waterloo or the Canadian Institute of Health Research.

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Note: A lot of movement has occurred with respect to indigenous rights, reconciliation and initiatives since the drafting of this report. Some concerns identified, especially with regards to determinants of health, are being addressed to various degrees locally, provincially, and federally.

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Executive Summary

This report investigates traditional food use and climate change impact on Aboriginal people in Grey and Bruce counties. It is intended to provide a base to support continued work in food security, healthy communities, and building relationships between Aboriginal populations in the Grey and Bruce area and the Health Unit. By investigating traditional food use in the context of climate change in Grey and Bruce Counties this document will also:

1. Provide insight into food security in an Aboriginal context
2. Provide a brief historical review Aboriginal People in Grey and Bruce counties
3. Highlight the role of traditional food in food
4. Provide a brief review of the determinants of health in an Aboriginal context
5. Highlight the need for climate change mitigation and adaptation locally

The Grey Bruce Health Unit (GBHU) provides some program based services to Saugeen First Nations and Chippewas of Nawash Unceded First Nations reserves in Bruce County. These two Bands are collectively known as the Saugeen Ojibway Nation (SON). There are two Metis groups in Grey and Bruce Counties, the Historic Saugeen Metis and the Metis Nation of Ontario. Approximately 5% of the population in Grey and Bruce self-identified aboriginal in 2006.

A brief review of Aboriginal history in Ontario and Grey Bruce Counties is intended to provide context for those not familiar with the history of First Nations and Metis People. Their culture has been tremendously impacted through imposed British dominance and assimilation policies. Various Treaties, legislation and forced residential schools have restricted First Nations people to reserve lands, subjected Metis and First Nations people to forced assimilation policies and denied them control over their land and lives.

Climate change is a long-term shift in weather conditions. In the Grey Bruce area, climate change is expected to increase temperatures (including lake water) and storm intensity, lengthen the growing season and periods of drought, and decrease lake ice cover. Precipitation is expected to happen more often in high intensity events with more rain in winter and spring and less over the summer. Many of these effects are already measurable and are shown in current climatic trends. The stress caused to terrestrial ecosystems is likely to cause changes in distribution of animals and plants and an influx of invasive species, pests and pathogens. This is expected to cause a reorganization of ecosystems in Grey and Bruce counties that will likely result in decreased diversity of plant, tree and animal life and increase pressure on agriculture. Grey and Bruce counties can expect to see more cases of animal and human Lyme disease due to expanding populations of the ticks that carry the causative microorganism. The effects on the Great Lakes may lead to lowered lake levels, wetland habitat loss and increased susceptibility to invasive aquatic plants. Warmer waters, increased contamination from run-off, and invasive species will affect water quality and increase competition for food resulting in reduced cold water fish species and cause more frequent blue-green algae blooms and botulism outbreaks.

Food security is recognized as an important social determinant of aboriginal health. Bellows and Hamm defined community food security as “*when all citizens obtain a safe, personally acceptable, nutritious diet through a sustainable food system that maximizes health choices, community self-reliance and equal access for everyone*” (2003). Food security for many Aboriginal People includes traditional foods important for diet, medicinal and ceremonial use. They involve a deep connection with the land and promote cultural values that influence mental,

emotional and physical health. Food insecurity is associated with income and linked to health issues and increased health care costs. The First Nations Food, Nutrition and Environment Study (FNFNES) found that First Nations people on reserves had higher rates of food insecurity, obesity and diabetes than non-aboriginal Canadians. Off-reserve First Nations and Metis people have lower rates, but still higher than non-aboriginal Canadians.

Historically, Ojibway and Metis people utilized a vast array of plant and animals harvested from their traditional territories for food, utilitarian and artistic purposes. Today, First Nations and Metis people are actively harvesting foods, but the contribution to the diet is difficult to determine considering the methods used for this report. Several barriers to harvesting traditional food, including access and cost were identified by First Nations and Metis people

Climate change is likely going to have a strong impact on the ecosystems in the traditional territory of the First Nations and Metis People of this area thus impacting current food and cultural resources but is not likely to greatly impact food security. First Nations and Metis people still use traditionally gathered foods, but it does not appear to be a major portion of the regular diet for most people. If traditional foods are impacted significantly, there will be a loss of the nutritional and physical benefits and increased risk of chronic disease. Active harvesters in Grey and Bruce counties will also be at greater risk of contracting disease through insect vectors. There may also be economic implications with limited whitefish (cold water fish) availability affecting the First Nations fisheries.

The social determinants of health are considered because the food systems and culture of Aboriginal people are intertwined and inherently tied to the environment. Factors considered include lower employment, income and education levels than the general population, intergenerational trauma and cultural discontinuity caused by government policy and residential schools, inadequate housing, lack of community infrastructure, resources and capacities, racism, and lack of self-determination.

Climate change is going to affect everyone, but it will have a stronger impact on aboriginal people and their cultures. Further investigation is required to determine the impacts of climate change, the strengths, vulnerabilities, and opportunities for the aboriginal people of Grey and Bruce counties. Responding and adapting to climate change does provide benefit from building resilience in communities, and increasing health, economic, social and environmental well-being. In the case of First Nations and Metis people, it may also strengthen cultural well-being

Recommendations for the Grey Bruce Health Unit include developing stronger relationships with the Aboriginal communities and organizations in Grey and Bruce counties, define and resolve jurisdictional issues in relation to public health needs on reserves, consider impacts to climate change in all relevant policies, and recognize climate change as a major factor in population health and work on increasing efforts to recognize this in a local to global context

Some suggestions are provided for First Nations and Metis Communities recognizing that each community is unique and cultural factors are very important in decision making. Suggestions include considering an EcoHealth study framework to assess climate change impacts on traditional territories and how those impacts will affect their communities, consider climate change in all developments and initiatives where relevant to take advantage of opportunities and mitigate negative impacts, investigate the use of traditional foods to reduce barriers and promote traditional food consumption, and joining with other First Nations communities in same ecoregion to share successes and adaptation initiatives.

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Preface

The concept of this report was developed in consultation with the Grey Bruce Health Unit to determine a practicum project that would benefit the Grey Bruce community, the health unit and serve the purposes of a practicum project. This consultation occurred while the health unit was initiating investigation into climate change in the context of public health impacts and emergency response in Grey and Bruce. Traditional food use by Aboriginal Peoples in Grey-Bruce was identified as a subject requiring further investigation and this topic was coupled with climate change to determine possible impacts on the First Nations and Metis communities in Grey and Bruce.

Introduction

This report aims to review food security issues and related health impacts, specifically as it relates to climate change and traditional food use of the Aboriginal populations in Grey and Bruce County. The Ontario Public Health Standards (OPHS) establish the minimum requirements for the programs health units provide and state “Addressing determinants of health and reducing health inequities are fundamental to the work of public health in Ontario. Effective public health programs and services consider the impact of the determinants of health on the achievement of intended health outcomes ” (2008). A key requirement of the OPHS is for health units “to identify and work with local priority populations” (2008). According to the OPHS, priority populations are “those populations that are at risk and for whom public health interventions may be reasonably considered to have a substantial impact at the population level” (2008). Based on these requirements of the OPHS, the GBHU has the mandate and requirement to identify priority populations and to develop interventions aimed at these populations to decrease inequities and increase positive health outcomes. Climate change will impact everyone, many studies and assessments have been conducted to determine positive and negative impacts. Negative impacts are expected to be greater on vulnerable populations, especially for Indigenous populations where culture and traditional food systems are inherently bound with the natural environment. The social determinants of health are important factors in health and food security is recognized as an important social determinant of Aboriginal health (Loppie Reading & Wien, 2009). As such, the impact of climate change on food security could be a very important factor in Aboriginal health.

First Nations are under federal jurisdiction and receive most services through federal programs. The Grey Bruce Health Unit (GBHU) provides services to Saugeen First Nations and Chippewas of Nawash Unceded First Nations (Bruce County) where specific agreements have been made. The services GBHU provides are program based and a broader understanding of health, culture, and needs of the First Nations people on reserve, off reserve, and for Metis people, is lacking at the GBHU. This report is a first step in learning more about these communities and how the Grey Bruce Health Unit can support healthy communities with a focus on food security for First Nations and Metis populations of Grey and Bruce.

Purpose

This report is intended to inform the health unit and other stakeholders about climate change impacts on traditional food use, food security and health in the Aboriginal populations of Grey and Bruce Counties. This report will also serve as a resource and base to support continued work in healthy communities, food security, climate change, and building relationships between the Grey Bruce Health Unit and Aboriginal populations in the Grey and Bruce area.

By investigating traditional food use in the context of climate change in Grey and Bruce Counties this document will also provide:

- A brief review of the history of aboriginal people in Grey and Bruce counties from an aboriginal context.
- Highlight the role of traditional food in food security for aboriginal people in Grey and Bruce Counties.
- Provide a brief review of the aboriginal determinants of health.
- Highlight the need for climate change mitigation and adaptation in these communities and local municipalities

Methods and Limitations

A literature search was considered at the outset of this project, but it became very apparent that there is little information specific to the Grey Bruce area regarding traditional food use, climate change, and food security. The bulk of this information relates to northern latitudes in Canada and is not applicable to Southern Ontario necessitating synthesis from many sources to piece together the required information to complete the report. Literature, grey materials, and government reports were reviewed and relevant, quality information were used to inform the topics. Due to time limitations, First Nations (on and off-reserve) and Metis traditional food use in Grey and Bruce counties was not formally researched. Instead, informal conversations with willing members of the populations of interest took place to inform the contemporary aspects of traditional food use and the current aboriginal experience. Having more time to make deeper connections and converse with First Nations and Metis people in the area, or to complete a structured research project, would have been beneficial in providing a clearer picture of traditional food use, food security issues, climate change impacts and current initiatives, More time would have also allowed a thorough look at the determinants of health.

An internal resource was also developed that provides and links to and a description of material that could helpful to Grey Bruce Health Unit staff working with Aboriginal clients.

In 2011 the Federal Government canceled the mandatory long form census and replaced it with the voluntary National Household Survey (NHS). The 2006 census results are the last available reliable source of information for most socio-demographic and determinants of health indicators until the next census in 2016 when the long form census will again be mandatory. Due to the increased bias and other issues it was decided the Grey Bruce Health Unit would not use the data from the NHS (Grey Bruce Health Unit, 2014).

Grey and Bruce Counties

Grey and Bruce Counties are upper-tier Regional municipalities in Southern Ontario, between Lake Huron and Georgian Bay. Both counties are ripe with beautiful scenery, a long



Figure 1. Grey and Bruce Counties (GBHU, 2014)

coast line with many beaches, plenty of tourism opportunities for all seasons, and a strong agricultural base. They are mostly rural with some areas of higher population density.

Lake Huron and Georgian Bay are part of the Laurentian Great Lakes, the second largest volume of unfrozen freshwater in the World supporting a unique marine and terrestrial ecosystem. The Great Lakes are a source of drinking water to over 30 million people living in the Great Lakes basin. Supporting a range of commercial, industrial, and recreational activities they are a critical part of the economic health of central North America (Gronewold et al., 2013). The Great Lakes ecosystem is under threat, not just from climate change but also from invasive species, pollution and development (Environment Canada & U.S. Environmental Protection Agency, 2014).

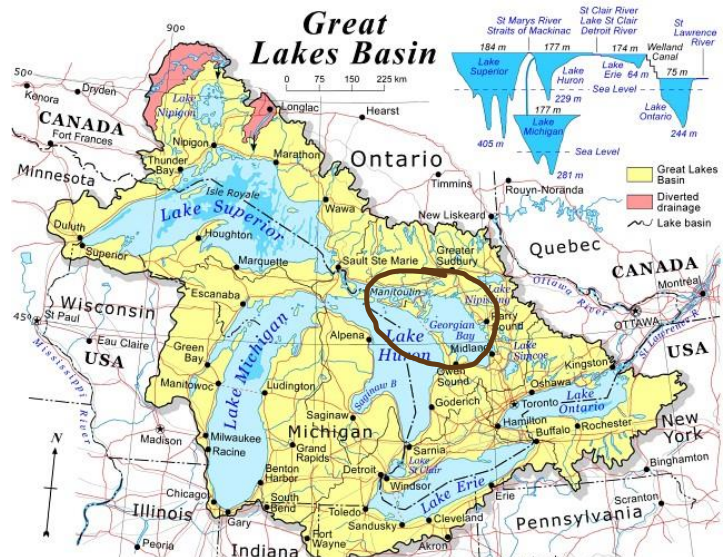


Figure 2. Laurentian Great Lakes Basin (NRC, n.d.)

There are two First Nations reserves in Bruce County, Saugeen First Nation adjacent to Southampton and Chippewas of Nawash Unceded First Nations at Neyaashiinigmiing on the Bruce Peninsula, collectively known as the Saugeen Ojibway Nation (SON). The SON have fishing rights in Lake Huron and Georgian Bay (Chippewas of Nawash Unceded First Nations, n.d.). There are two Metis groups in Grey and Bruce Counties, the Historic Saugeen Metis (HSM) in the Historic Saugeen Territory and the Metis Nation of Ontario (MNO). These are specific representation bodies for Metis in Ontario (Metis Nation of Ontario, 2016).

For a more detailed description of Grey and Bruce Counties please see the Grey Bruce Health Unit State of the Environment Report at and the Grey Bruce Healthy Community Picture – 2014 Supplement. Both reports are available from the Grey Bruce Health Unit website at <https://www.publichealthgreybruce.on.ca/>.

Grey and Bruce Basic Demographic Profile

It is important to note that census data collected from Aboriginal groups in Canada are often not accurate. There are a number of reasons for this, including non-response, lack of coverage, mobility, and lack of self-identification as an aboriginal person. Study data is often collected through self-report and there is an inherent bias with this type of data collection (Smylie & Anderson, 2006).

In Ontario (2006 census data), there are over 12,028,000 people with close to 242,500 self-identifying as Aboriginal (First Nations, Metis or Inuit). This census data excludes incompletely enumerated reserves or settlements so the actual number is likely higher. Approximately 158,395 First Nations, 73,605 Metis and 2,035 Inuit reside in Ontario (Statistics Canada, 2009).

In 2006, the population of Grey and Bruce was approximately 150,760. Of this, close to 5% of the population (approximately 3,655) self-identified as Aboriginal. Grey County had a population of approximately 92,411 with about 1,470 self-identifying as Aboriginal. Bruce County had a population of approximately 65,349 with 2,185 self-identifying as Aboriginal (Statistics Canada, 2007a). A breakdown can be seen in the following chart.

The population of Neyaashiinigmiing was 600 to 700 and the population of Saugeen First Nations was over 700 in 2006. The median earnings and income for Aboriginal people over 15 who worked are lower than the total population in Grey and Bruce counties (Statistics Canada, 2007b, 2007c, <http://www.nawash.ca/population/>).

Grey County					
	Population		Median Age	Median Earnings* (\$)	Median Income* (\$)
Total	92,411		44.4	22,978	23,914
Aboriginal	1,470		29.3	17,943	17,860
	First Nations	605			
	Metis	825			
	Inuit	10			
Bruce County					
Total	65,349		45.1	21,825	24,294
Aboriginal	2,185		32.1	14,966	12,830
	First Nations	1,725			
	Metis	360			
	Inuit	10			
(Statistics Canada, 2008a, 2008b) * See Appendix 1 for glossary of terms					

Table 1. Aboriginal Population and Income (Grey and Bruce County)

A Brief History of Saugeen Ojibway, Traditional Territory and Grey & Bruce Counties

This is a basic and brief account of the history of the Ojibway people in what is now the Grey and Bruce area. This is intended to be in an aboriginal context from the arrival of the first Europeans and is not meant to provide a comprehensive historical review. The purpose is to provide context for those who are not familiar with the history of First Nations and Metis People in Ontario. There are a number of resources for in-depth learning, including historical documents and well researched books available from the Bruce County and Grey County archives, libraries, resources from First Nations and Metis organizations, academic and government resources (i.e., Truth and Reconciliation Report).

The Ojibway are part of the Anishinaabe Nation. The Anishinaabe Nation includes the Confederacy of Three Fires, an alliance of the Anishinaabe people. The Ojibway (faith keepers), Odawa (the protectors) and Pottawatomi (keepers of the fire) are the three nations of the Confederacy. The patrilineal kinship system was based on dodems i.e. the loon. The dodem is important in inter-clan relations, marriages, and traditional occupations. Each clan had a gift from the Creator that was an important contribution to the community. Clan systems organized the work and although each clan had different responsibilities they were all considered equal (Georgian College, 2016).

The Early Years

Indigenous people lived in Canada for thousands of years before the arrival of Europeans and there is evidence of these people in Southern Ontario (McArthur, McNabb & McNabb, 2013; Stork, 1982). Before colonization, the Ojibway (spelling varies) were the most numerous of the First Nations People in Ontario (Ojibway is a name ascribed by first contact Europeans, the Ojibway I referred to themselves, along with other groups within the same language family, as Anishnaabe –spelling also varies). They led a semi-nomadic sustenance lifestyle with a rich culture and a strong relationship with the land and spiritual world. The Ojibway People had semi-permanent settlements around Georgian Bay and Lake Superior and moved throughout the region on a seasonal basis (Rogers & Smith, 1994; Schmalz, 1991). The Ojibway territory encompassed about 2 million acres of land, including all of Grey and Bruce Counties and northern parts of surrounding counties (Chippewas of Nawash Unceded First Nations, n.d.; McArthur et al., 2013; Schmalz, 1991). The introduction of fur traders in the early 1600's and the wares they brought began to change the lifestyle of the Ojibway and other First Nations in the New World. The fur trade also brought war as different tribes vied for larger hunting territories to supply furs to trade with the Europeans (Rogers & Smith, 1994; Schmalz, 1991; Warren, 2016).

The Metis Nation developed out of marriages between European traders and First Nations women in the 1600s. French fur traders especially were encouraged to marry First Nations women with a view to merging the Indigenous culture into the French culture (McArthur et al., 2013; Rogers & Smith, 1994). In the 1700's, a unique culture arose from the offspring of these mixed heritage people. The practice of intermarriage was discouraged once it became apparent that the "half-breeds" (as they were then called) were developing a distinct culture rather than becoming one with the French, now known as the Metis Nation (McArthur et al., 2013, pp. 14, 15). The Metis people shared territory with the Ojibway, hunting, fishing, and trapping (Historic Saugeen Metis, n.d.; McArthur et al., 2013).

The Changing Relationship

The Ojibway people were originally seen as allies in the various colonial wars and uprisings occurring in North America before colonization. As they became less important as allies and their traditional lands were coveted by settlers, the relationship with the new settlers changed and British dominance began to erode their traditional way of life (Government of Canada, 2013; Rogers & Smith, 1994; Schmalz, 1991). At the end of the Seven Years' War and the beginning of British rule in North America in 1760, settlers began to move into the area, many of them English soldiers from the war period. The Royal Proclamation of 1763 was meant, in part, to protect "Indians" (the legal name in Canadian Government documents) from encroachment, fraud, and abuses of these settlers. It set the rules and protocols for dealing with First Nations people. The Proclamation set out a boundary for land which was to be reserved for the Indians, recognized the legal right of the Indians to the land, set rules that none of that land could be sold except to the Crown and that settlement could not take place until the crown had secured the land from the Indians (Government of Canada, 2013; Indigenous and Northern Affairs Canada, 2013b; Rogers & Smith, 1994; Schmalz, 1991). After the War of 1812 there was another influx of settlers. During this period treaties ceded much of the land in Southern Ontario. Further encroachment to the north led to the Treaty of 1836 in which the Ojibway surrendered 1.5 million acres of land south of Owen Sound. The area was attractive to settlers given all the resources available; fur, game and fish, rich farmland and water ways for powering grist mills and sawmills, plus plenty of trees for lumber. (Grey Bruce Health Unit, 2014; Indigenous and Northern Affairs Canada, 2013a; Schmalz, 1991). The surrender of these lands did not stop encroachment and a Royal Declaration was issued in 1847 to confirm the land the Saugeen Ojibway held. In 1850 an Act was passed to protect the un-surrendered lands and the First Nations people,

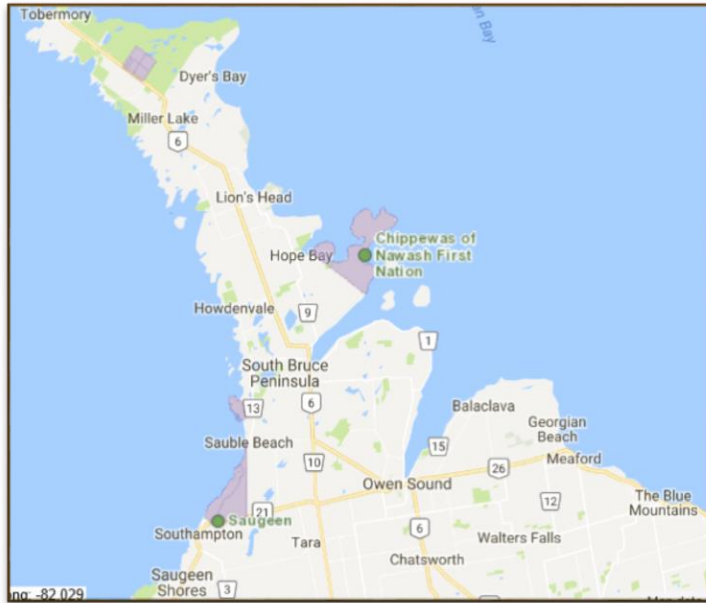


Figure 3. First Nations Reserve areas in Bruce County (AANDC Canada, n.d.)

but it was not seriously enforced (Rogers & Smith, 1994; Schmalz, 1991). In 1851 another treaty was signed to allow a roadway from Owen Sound to Southampton. Further treaties surrendered even more land. Grey County was established in 1852 and Bruce County was established in 1857 (Grey Bruce Health Unit, 2014; Grey Roots: Museum and Archives, n.d.). The land surrenders resulted in the current landscape of reserves and land held for the First Nations communities: Saugeen First Nation reserve, Nayaashiinigmiing (Chippewas of Nawash Unceded), Chiefs Point (near Sauble Beach), hunting grounds near Tobermory, and fishing grounds in Lake Huron (Chippewas of Nawash Unceded First Nations, Grey Bruce Health Unit, 2014; Rogers & Smith, 1994).

Assimilation as a Policy

As land was surrendered to the British Government the semi-nomadic way of life was no longer possible and the small reserve tracts limited access to hunting and gathering thus creating a dependency on the Government (Government of Canada, 2013; Government of Ontario, 2014; Rogers & Smith, 1994; Schmalz, 1991). The Indian Act of 1820 was the first of several pieces of legislation aimed at assimilating “Indians” with the intention of dissolving reserves and ending Crown obligations that ensued from The Royal Proclamation (Government of Canada, 2013; Indigenous and Northern Affairs Canada, 2013b; Schmalz, 1991). This practice continued after the Management of Indian Lands and Property Act (Indian Land Act) transferred authority for Indian affairs to the colonies. The newly formed Dominion of Canada (1867) assumed native affairs as a Federal responsibility and created the Indian Act of 1876 to consolidate the inherited Indian legislation. This Act and many amendments in the following years increased government control over all aspects of First Nations lives by giving more authority to the Department of Indian Affairs, year after year, with the intent of integrating Indians into “civilized” Canadian society.

As a few examples, the legislation ultimately gave the Department the authority to

- Manage Indian lands, resources and money
- Control access to intoxicants (i.e., alcohol)
- Promote “civilization”
- Impose new systems of band governance, giving final authority to the Indian agent (a government representative on the Reserve)
- Ban religious and spiritual ceremonies.
- Infer automatic enfranchisement - losing Indian status - when certain qualifications were met (i.e. obtaining a university degree, an Indian woman marrying a non-Indian man)
- Forbidding fundraising by First Nations to pursue land claims without having permission from the Department of Indian Affairs

The government and Indian agents continued to push for abandonment of traditional lifestyles and adoption of agriculture (often on unsuitable land), civilization, and assimilation (Government of Canada, 2013; Schmalz, 1991). Residential schools were a large part of this push for First Nations to abandon their culture and traditional ways of life. Children were taken from their parents and sent to residential, or in some cases day schools, where they were taught reading, writing, and arithmetic along with basic job skills. They were not allowed to speak their native language or continue practicing their cultural ways. They were also often neglected and abused. Many children were also taken in the “Sixties Scoop” and adopted out to white families where they lost all ties to their blood relatives and culture (The Truth and Reconciliation Commission of Canada, 2015). It was 1960 before First Nations were able to vote without giving up their Indian status, as they had been considered “wards of the state” and had no political power (Government of Canada, 2013). By 1969, the Canadian Government recognized that the reserves were lacking basic amenities, were underserved and lacked economic opportunities (Government of Canada, 1969). Despite various proposed or approved legislation, policy changes and reconciliation efforts, the majority of First Nation reserves remain without proper services and economic development today.

The Metis Nation – A Unique Culture

The Metis Nation developed out of intermarriages between European traders and Indian women in the 1600s. By the 1700s, a unique culture arose from marriages between the offspring of these intermarriages. The unique qualities of Metis people made them indispensable in Aboriginal/non-Aboriginal economic partnerships and this position contributed to the forming of the culture (Schmalz, 1991). Although the Metis were made promises of land grants in some areas of Canada, they were not recognized legally as a distinct Aboriginal People until 1982 when Section 35 of the Constitution Act (1982) recognized and affirmed the Aboriginal rights of Métis, First Nations and Inuit people (Canadian Charter of Rights and Freedoms, 1982; Historic Saugeen Metis, n.d.). It took until 2003 before the supreme court of Canada upheld Metis rights to harvest. This led to Ontario recognizing the Metis Harvester Card system in 2004, allowing the Metis Nation to harvest in a similar manner to First Nations (Metis Nation of Ontario, 2003). Some aspects of Metis heritage are similar to First Nations as they share a common ancestry, but they have formed a unique and very different culture. Just like the First Nations, there is great diversity as each distinct group of Metis people has unique customs.

Climate Change

“Continued emissions of greenhouse gases will cause increased warming and long-lasting changes in Earth’s climate system, increasing the likelihood of severe, pervasive and irreversible impacts for humans and ecosystems. Limiting climate change would require substantial and sustained reductions in greenhouse gas emissions which, together with adaptation, can limit climate change risks” (IPCC, 2014).

See appendix 1 for a basic description of climate change and of many terms used in this report.

Climate Change in General

Climate change is a long-term shift in weather conditions identified by changes in temperature, precipitation, winds, and other indicators. Climate change may also be indicated by an overall

change in average conditions or in variability, such as increased frequency of extreme precipitation events. (Government of Canada, 2015). Climate change does happen naturally, but the current pace of change is unprecedented and is being caused by human activity, mainly the emission of greenhouse gasses (GHG's, gasses that let solar energy pass through the atmosphere but trap energy radiated by the earth). Climate projections vary depending on the scenario method used and the inputs. Generally all scenarios under low, medium and high levels of GHG emissions project the earth's surface temperature rising over the 21st century, with greater increases occurring faster at higher emission levels. These scenarios indicate it is *very likely* that heat waves will occur more often and last longer, and extreme precipitation events will happen more frequently and be more intense in many areas (IPCC, 2014).

Generally in Ontario we can expect to see increasing temperatures with greater warming in the winter, increased lake water temperatures with less ice cover, a longer growing season, increased intensity of storm events with increased periods of drought and increased wind. Depending on the climate change scenario, average temperatures are projected to rise by up to 5°C, possibly more. Many of these effects are already measurable and are shown in current climatic trends (Centre for Indigenous Environmental Resources & University of British Columbia, 2006; IPCC, 2014; Sousounis & Grover, 2002; Thompson, Flannigan, Wotton, & Suffling, 1996; Wang, Huang, Liu, Li, & Zhao, 2015; Wang et al., 2015).

Climate Change in Grey Bruce

Climate modelling for regional areas is difficult to do. It requires downscaling of global climate models using regional data that is often not available in the long-term time frames required, not to mention the computational resources needed (Wang et al., 2015). Recognizing these limitations, the regional projections generally agree on the basic climate projections that are presented here, unless otherwise stated.

The Grey Bruce region has a unique geography, nestled between Lake Huron and Georgian Bay. These water bodies create a unique local climate with a modifying effect on temperatures, length of seasons, and impacting winter precipitation with lake effect snow (Environment Canada & U.S. Environmental Protection Agency, 2014; Kling et al., 2003; Mortsch & Alden, 2003). Mean annual air temperature is projected to rise by about 2 to 8°C by 2080, with the greatest increases occurring in winter and spring. (Kling et al., 2003; McDermid et al., 2015; Wang et al., 2015). Summer temperatures could increase to about 30.0°C with high humidity, along with the possibility of summer heat events where highs exceeding 40°C occur regularly (Price et al., 2011). Precipitation projections under different scenarios indicate there is a possibility of less summer precipitation and increased periods of drought. Winter will likely receive more precipitation, but more of it is likely to be rain rather than snow. The precipitation that does occur will more likely happen in intense events with high precipitation amounts over short time periods, such as an intense thunderstorm or lake effect snow event (McDermid et al., 2015; Price et al., 2011; Wang et al., 2015). These projections show wide variations with differing confidence levels, so although these changes are likely to occur the extent of precipitation levels and events are uncertain. Overall the changes in local conditions will shift the current ecosystem north. By the end of the 21st Century summers may be more like the hot and humid summers that Northern Virginia in the United States has now (Fig. 4) (Kling et al., 2003; Price

et al., 2011). The shift of our current climate northward would occur more quickly and move further north under higher emission scenarios (Fig. 5). Impacts are very likely to be striking as our climate envelope moves north, but are hard to predict in relation to ecosystems and species interactions. There have been few studies on the ecosystems in Southern Ontario in relation to climate change so mostly only generalizations can be made based on climate projections and observations in studied ecosystems. The change in climate will have different effects on plants, animals, and ecological communities causing disruption and reorganization of the Great Lakes ecosystem.

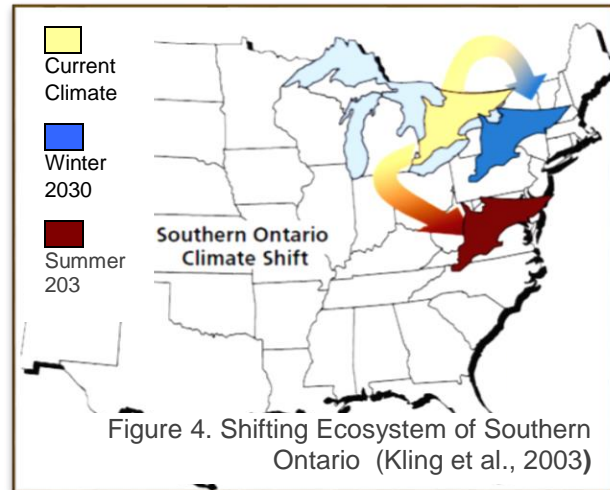


Figure 4. Shifting Ecosystem of Southern Ontario (Kling et al., 2003)

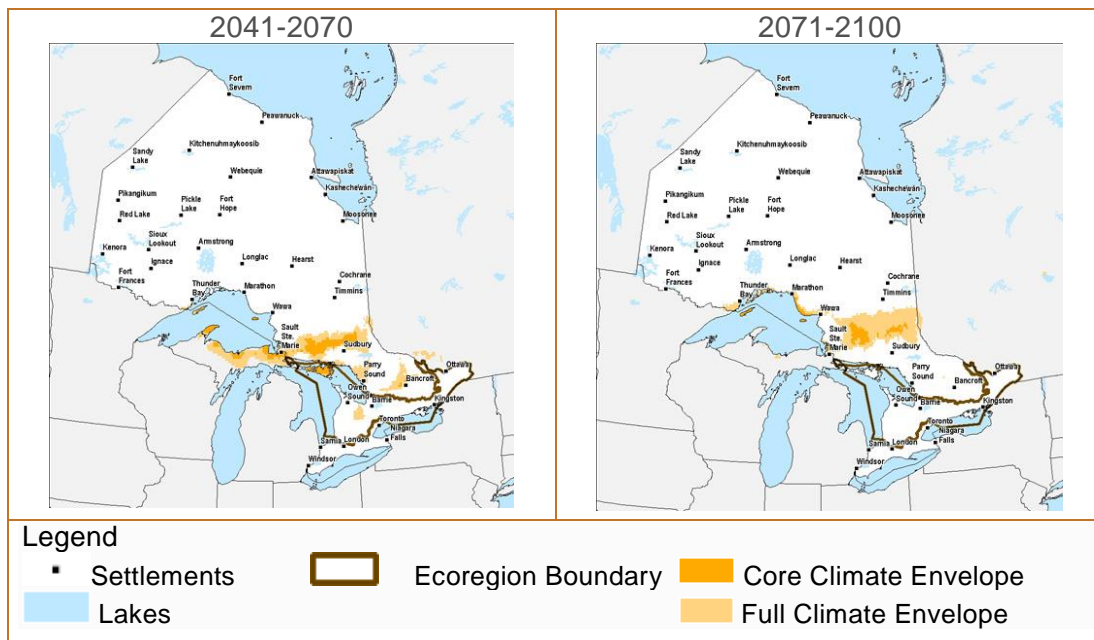


Figure 5. Ecosystem Boundary Change Simulation. (Gov. Ont., 2015)

Impacts on Land

The terrestrial environment will be impacted by changing precipitation (amount and timing), higher temperatures and increasing carbon dioxide (CO₂) concentrations (IPCC, 2014; Stevenson et al., 2015). Projected increases in summer temperatures indicates the possibility of more heat waves that could affect human health and mortality (Government of Canada, 2008; Kling et al., 2003; Mortsch & Alden, 2003). Increases in the number of frost-free days results in a longer growing season and increases in CO₂ contribute to greater plant growth, but this could be offset by drought, intense precipitation and flooding, early plant maturity, and increases in pathogen and pest activity (Great Lakes Integrated Sciences + Assessments, 2014; Kling et al., 2003; Stevenson et al., 2015). Pests and pathogens currently not seen in Grey and Bruce counties will become more of an issue as invasive species move north (Colombo, 2008; Nituch & Bowman, 2013). Pathogen vectors, many of them insects, are often limited in range and distribution by temperatures (Brownstein, Holford, & Fish, 2005; Nituch & Bowman, 2013). The ability of insects to add a generation with a longer warm season

would potentially increase their numbers, predation and disease (Colombo, 2008; Nituch & Bowman, 2013) However, if a mismatch in timing occurs between pests or pathogen vectors and their food source they could decrease (Colombo, 2008). In Grey and Bruce we can expect to see more cases of human and animal Lyme disease due to expanding populations of the ticks that are capable of carrying the causative microorganism (*Borrelia burgdoferi*) (Brownstein, Holford, & Fish, 2005; Nituch & Bowman, 2013). West Nile Virus is another example, with mosquitoes as the vector.

Forests in the Great Lakes region are likely to become stressed due to the changing conditions, making them more susceptible to disease outbreaks, insect predation and forest fires. Most tree pests are expected to increase in populations and move north since warmer winter temperatures are less likely to hinder survival. Examples of this are the spruce budworm and Emerald Ash Borer (Canadian Food Inspection Agency, 2013; Centre for Indigenous Environmental Resources & University of British Columbia, 2006; Colombo, 2008; Mortsch & Alden, 2003; Nituch & Bowman, 2013). Given the low ability of most trees to disperse seeds over great distances, the long generation time, and lack of greenspace connections, the ability of trees to move north with the shifting climate is very limited and may not keep pace with climate change. This hampers the natural regeneration and species shift that would normally take place, eventually resulting in less diversity, less old growth forest patches and an overall change in tree species in Grey and Bruce counties (Centre for Indigenous Environmental Resources & University of British Columbia, 2006; Colombo, 2008; Environment Canada & U.S. Environmental Protection Agency, 2014; Thompson et al., 1998). Ecosystems will also be effected by changes in phenology: plants and animals with genetic diversity and short generations are able to respond more quickly and adapt faster to a changing environment, those with longer life spans and fewer generations take much longer to adapt. This difference can lead to a mismatch in between predator and prey and pollinator and plant lifecycles resulting negative impacts. Examples include arrival of migrating birds travelling to their breeding grounds at the same time seasonally, but their key insect prey have become most abundant earlier in the season, and outbreaks of pests due to delayed appearance of key predators (Nituch & Bowman, 2013; Stevenson et al., 2015). Changes in species distribution may also occur so there is less of an overlap in habitat (Fig. 6) (Nituch & Bowman, 2013; Stevenson et al., 2015). This can lead to decreased genetic and biological diversity as suitable habitats shrink and populations of plants and animals separate, decrease, and possibly crossbreed more frequently (Nituch & Bowman, 2013; Stevenson et al., 2015; Thompson et al., 1996).

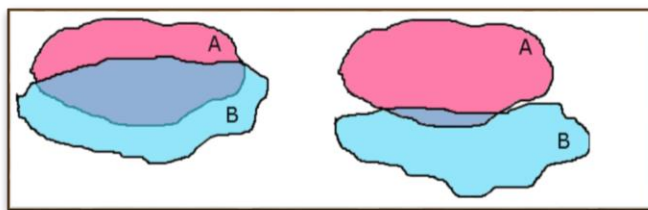


Figure 6: Initial Distribution of Species A and B before and after Climate Change Impacts. (Range of Distribution - species A moves north faster than species B) (Nituch & Bowman, 2013).

Animals and plants could also become more susceptible to pathogens due to heat stress, limited availability of food, drought or flood conditions and changing ecosystems (Colombo, 2008; Nituch & Bowman, 2013).

Larger animals are able to move greater distances to cope with changing conditions which may cause them to move out of traditional territories and create new range overlaps with other species where they are able to transfer pathogens not previously encountered. One example of this is the White-tailed deer whose populations are expected to encroach on moose territory. Deer populations carry a parasite that is fatal to moose and it is expected that the increased pressure on moose populations will cause them to move further north (Thompson et al., 1996).

Soils will also be affected by climate change, but it is not fully understood how due to complex interactions. CO₂ is the primary food source for plants, but growth could be limited by nitrogen availability as the ratio between carbon and nitrogen in soils change (Brevik, 2012). The pH, nutrient and microorganism content of soils can also be altered by the types and amount of leaf litter and organic materials, temperatures, intense precipitation, flooding and microorganisms in the soils which could affect plant growth (Brevik, 2012; Brinkman & Sombroek, 1996).

A recent joint study between the Grey Bruce Health Unit and the Ministry of the Environment and Climate Change confirmed that the air monitoring station in Tiverton is reflective of air quality in Grey and Bruce Counties (Grey and Bruce County do not have any air monitoring stations). Currently, the air quality is good and is not likely to impact health in this region. This could change if current global air circulation patterns change or more regional wind patterns shift and bring smog from larger centers in the United States and Southern Ontario. There could also be local impacts if new industry locates within the region. There is a plan in place to monitor air quality data from surrounding air monitoring stations and if there are any trends away from current results, or meteorological data shows shifting wind currents, there will be an assessment to determine if there should be another evaluation (Hart, 2016; Ontario Ministry of the Environment, 2015).

This is just a brief overview, there are many other interactions and considerations that are beyond the scope of this paper. Due to the complexity of ecosystem interactions and limited understanding of soil dynamics under changing climatic conditions, it is very difficult to project what will occur in these systems as the climate changes. It is very likely that biological diversity will decrease and species ranges (plant and animal) will decrease and move north. Pressure on the agricultural food-production system will increase due to the changes in precipitation and increased pest and pathogen incidence. Beyond that it very much depends on how plants, animals, insects, microorganisms, and soils adapt to changing conditions and how ecosystems reorganize as to what can be expected to occur in Grey and Bruce counties

Impacts to Water

The impacts on water based ecosystems are difficult to predict because of the multitude of factors involved, but many projections indicate basic changes as outlined here.

Lakes in the region are projected to have less ice cover and increased temperatures (McDermid et al., 2015; J. Trumpickas, Shuter, & Minns, 2008; Justin Trumpickas, Shuter, Minns, & Cyr, 2015). Lake levels may or may not change due to climate change (Angel & Kunkel, 2010; Fracz & Chow-Fraser, 2012). Contributions to lake levels include less ice cover and increased temperature differences between the air and water increasing evaporation, and variable precipitation levels (Angel & Kunkel, 2010; Environment Canada & U.S. Environmental Protection Agency, 2014; Gronewold et al., 2013; Mortsch & Alden, 2003). Isostatic rebound and drawing water from the lakes are not climatically related and have not generally been considered in climate change research (Gronewold et al., 2013; Kling et al., 2003). Considering these factors it is likely that the lake levels will decline.

The expected increased intensity of storms can contribute to increasing nutrient and general pollution in the Great Lakes through increased short-term volumes of water run-off and increased flooding. Shoreline habitat damage is also expected and further increased by intense wind coupled with less ice cover in the winter. Wetland habitat loss and shoreline disturbances increase susceptibility to invasive species. (Centre for Indigenous Environmental Resources & University of British Columbia, 2006; Government of Canada, 2008; Mortsch & Alden, 2003). The *Phragmites* reed can invade recently exposed shoreline where it easily and rapidly spreads through seeds and rhizomes, becoming impenetrable to fish, other aquatic species and wetland plants. It is unknown as to what extent new wetlands may form with lower water levels (Fracz & Chow-Fraser, 2012). General water

quality may also decrease by the release of chemicals into the aquatic environment, such as mercury and phosphorus in sediments being exposed and released. This could change water chemistry and increase harmful chemical accumulation in edible fish (Environment Canada & U.S. Environmental Protection Agency, 2014; Kling et al., 2003; Mortsch & Alden, 2003).

Great Lakes water temperatures are also expected to increase by varying degrees. (Angel & Kunkel, 2010). Surface temperatures of the Lakes have already started to rise and are projected to rise the greatest in shallower and nearshore areas. This will decrease available habitat and refuge for cold water species of fish and contribute to the growth and spread of cool and warm water native species and some invasive species. This will create competition for food sources, territory, and increase predation on native species (Environment Canada & U.S. Environmental Protection Agency, 2014, 2016; Pagnucco et al., 2015; J. Trumpickas et al., 2015, 2008; Trumpickas et al., 2015; (Pagnucco et al., 2015; Trumpickas et al., 2015; YuChun, Madenjian, Bunnell, Lofgren, & Perroud, 2015). Invasive zebra and quagga mussels have already altered nutrient cycling in the Great Lakes contributing to algae blooms, nuisance algae growth, and reducing nutrient availability off-shore, causing changes in the aquatic food system (Environment Canada & U.S. Environmental Protection Agency, 2014; Mortsch & Alden, 2003; Pagnucco et al., 2015).

Another possible implication of rising lake temperatures is a decrease in dissolved oxygen (warm water absorbs less oxygen than cold water). There is also an increase in the duration of stratification (warmer water layer over colder deeper waters that prevents mixing) preventing oxygenation of bottom waters which limits available refuge for cold water fish (Mortsch & Alden, 2003; YuChun et al., 2015; Kling et al., 2003). The warmer water and stratification effect on oxygen could be offset by mixing caused by lack of ice cover, intense weather, and wind (Mortsch & Alden, 2003, 2003; Palmer, Yan, & Somers, 2014; Rennie, Weidel, Claramunt, & Dunlop, 2015; Trumpickas et al., 2015; YuChun et al., 2015).

Increased nutrients and warmer water in the Great Lakes are contributing to more frequent toxin producing blue-green algae blooms that are mainly affecting birds and aquatic life but can cause skin irritation and organ damage in humans (Environment Canada & U.S. Environmental Protection Agency, 2014; Mortsch & Alden, 2003; Pagnucco et al., 2015). Forest fires can also contribute to algal blooms with increased erosion from lack of vegetation cover and ammonia, nitrogen and phosphorous based fire retardants in run-off adds nutrients to the water (Ontario Ministry of Community Safety and Correctional Services, 2016; Page & Zygmunt, 2013). Fish concentrate the microcystin toxin produced by these algal blooms in their tissues. Large algal blooms and decomposing organic matter can also lead to botulism outbreak that kill large numbers of fish, aquatic animals and birds by creating anoxic conditions (lack of oxygen) required to activate botulism spores. (Environment Canada & U.S. Environmental Protection Agency, 2014; Mortsch & Alden, 2003; Pagnucco et al., 2015). This is already occurring in Lake Erie and Lake Ontario. In 2011 thousands of birds died from a botulism outbreak in Georgian Bay (Ricetto, 2011).

Overall the aquatic ecosystem will experience stress and there will be a change in water quality and a decrease in available fish spawning ground. Native cold water species populations are likely to decrease while warmer water and invasive species are likely to increase in number (Great Lakes Integrated Sciences + Assessments, 2014; Kling et al., 2003; Mortsch & Alden, 2003).

Food Security and Health

*The World Food Summit in (1996) defined food security as “...when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life”
(Government of Canada, 1998)*

Food security is recognized as a proximal, or important, social determinant of Aboriginal health (Loppie Reading & Wien, 2009). Considering the above definition, household food security in an aboriginal context can be thought of as the household's ability to obtain and use safe, nutritious, and healthy foods that are culturally appropriate. The ability to obtain food can include hunting, gathering, growing, sharing or buying market food and having the equipment or facilities required to do so. “Use” can be considered as having the knowledge and facilities to store and prepare these foods. Bellows and Hamm further defined community food security as existing when “all citizens obtain a safe, personally acceptable, nutritious diet through a sustainable food system that maximizes health choices, community self-reliance and equal access for everyone” (2003). Inherent in this definition is that the ability to acquire food is assured, human dignity is upheld in the food procurement, the food is safe, nutritious, and is acceptable culturally. It implies is that there is enough quality food for healthy growth and proper development, the prevention of disease and illness. Also important is sustainability, the production, processing, and distribution does not compromise the environment (land, air or water) for future generations (Bellows & Hamm, 2003). The term citizen does apply a colonial lens, and infer that a person is a member of a city, province or country. Food security is an important aspect of health and for and for many Aboriginal people also includes traditional (or country) foods. These foods are important for diet, medicine and ceremony. They involve a deep connection with the land and promote cultural values, such as sharing and cooperation, that influence mental, emotional and physical health (Dyck, 2008; NCCAB, 2012, 2013; Power, 2008). In this respect, a community definition may describe the idea of food security for Aboriginal people more appropriately. Food insecurity is associated with income and linked to a host of health issues, including malnutrition and related illnesses, obesity, diabetes, cardiovascular diseases and increased health care costs (Community Nutritionists Council of BC, 2004; Kirkpatrick SI, McIntyre L, & Potestio ML, 2010; Nicholas Vozoris & Tarasuk, 2003; PROOF, 2016). The First Nations Food, Nutrition and Environment Study (FNFNES) found that 29% of on-reserve Ontario First Nations households experience food insecurity, 53% of women and 49% of men are obese and 30% of adults have diabetes (Chan et al., 2014). While across Canada, age standardized rates from Statistics Canada (2011) indicate the diabetes prevalence rate on First Nations reserves was 17.2%, off-reserve was 10.3%, and Metis 7.3% while the non-Aboriginal population had a rate of 5.0% (Public Health Agency of Canada, 2011). The Canadian Community Health Survey (2007 – 2010 datasets combined) indicate that 22% of First Nations people living off reserve (12 and older) and 15% of Metis lived in households that experienced food insecurity while only 7% of non-Aboriginal people experienced food insecurity. The obesity rate for First Nations (off reserve) was 26%, for Metis it was 22% and only 16% for non-Aboriginal people (Gionet & Roshanafshar, 2011). The inaccuracy that can be involved with aboriginal health data is important but does not detract from the fact that study after study shows that chronic illnesses and diabetes are increasing and are at higher levels of prevalence in aboriginal communities in Canada. Despite food security being an important determinant of health, there is little information readily available for Grey and Bruce, and even less is known about traditional food use and climate change may affect food security and health in this region.

Traditional Food Use and Procurement

Historically

The Ojibway were a seasonal people, they moved, gathered plants, hunted, trapped, and fished according to the seasons and seasonal cues helped them to know when it was time for a specific type of harvest. As well, groups would divide responsibilities so some would hunt, others would gather, and larger groups would meet at certain times of the year for events such as rice harvesting and specific ceremonies (Aboriginal Healing and Outreach Program, 2009; Schmalz, 1991). Berries, fruits and herbs were important and many were dried so they could be stored and used when they were not in season. Nuts were consumed and used for many other purposes. Butternuts (White Walnut) were a common example given. There are butternut trees in Ontario but populations have been decimated by a fungus introduced by trees brought to Canada by Europeans and are now a species at risk (Bales, Ontario Ministry of Natural Resources, Environment Canada, & Forest Gene Conservation Association, 2010).

Wild rice (an aquatic grain), corn, squash, beans and peppers were important food plants, but a vast array of plants were utilized for food and flavouring (Moerman, 2014). Maple syrup was also produced in the spring. Other herbs and plants were important for medicine and ceremonial uses (i.e. tobacco, sage, sweet grass, wild ginger). Plants and trees were used for a variety of other uses including but certainly not limited to making baskets, building materials, dyes, toys, fuels, tools and cash crops (Moerman, 2014). Many small and large animals (i.e. rabbits, deer, birds and waterfowl) were utilized for food, clothing and tools among other uses. Fish were also an important part of the diet. They did not have white flour, salt, milk, lard or refined sugar as a part of their diet before Europeans made contact (Schmalz, 1991).

Corn, Beans and squash are the Three Sisters. These staples were very common in First Nations communities in temperate climates. Aboriginal people learned to plant the three plants together for their symbiotic relationship and increased resistance to pests from integrated planting. Corn is a nitrogen user, beans fix nitrogen, the corn provides support for beans and squash shades the soil. This is just one example of how keenly Aboriginal people understand ecology through their traditional beliefs, teachings and practices.

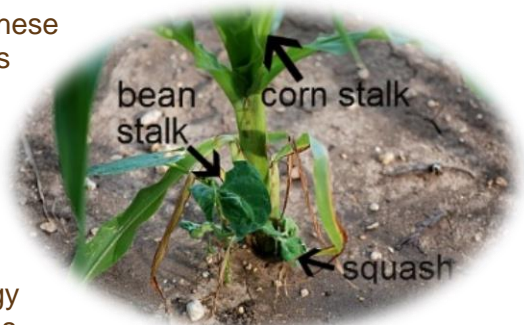


Figure 7. The Three Sisters


The Historic Saugeen Metis had similar foods and other uses, since they descended from Ojibway mothers, but they did have influence in their diets from their European ancestry. They would can many foods, including meats and fish. Store bought staples contributed to the diet if they could be afforded and ice houses they were used to store perishable foods if they had access to one. An item like fry bread (made from white flour), meat pies and other such foods could be considered traditional Metis food but it would depend upon the strictness of the interpretation of “traditional”. Many of the foods were high in caloric content, low in fat and also nutritionally dense, a requirement given the active lifestyles of subsistence living (Earle, 2011).

Today

First Nations people both on and off reserve and Metis people are actively harvesting (hunting, trapping, fishing, and gathering plants) for foods, medicines and ceremonial use in the traditional Saugeen Ojibway and Historic Saugeen Metis territories. Many of the foods harvested are similar, but are more likely utilized by First Nations on reserve. One food that was mentioned frequently but not consumed often was wild rice, this is probably due to lack of availability since there is only one known spot for harvest in Grey and Bruce counties and it is not widely available in stores. The number of people actively participating in harvesting and the contribution to the diet is difficult to determine considering the methods used for producing this report.

First Nations on Reserve

Many First Nations people living on the reserves do not necessarily share knowledge of what plants they are gathering nor where they are finding the plants (Chan et al., 2014). In some cases leeks and other important plant populations have been decimated by First Nations or Metis and non-Aboriginal



As the Western World has dominant religions based on Genesis, Aboriginal people have Creation stories. Although varied, there is a common theme of earth, water, plants, wind and animals being created first. The Creation stories ask the animals and plants to teach the humans how to live sustainably and ethically. This is a vast contrast to religions based on Genesis where humans are considered dominant. These traditional teachings form the basis for the beliefs of spirit in inanimate objects and all living organisms along with the keen observation skills and ability to learn so much from environment. These teachings also support sustainability by instilling beliefs and practices around only taking what is needed, not wasting, and sharing with others. This section has been based largely on the knowledge and personal thoughts shared with me by First Nations (on and off reserve) and Metis People in Grey and Bruce counties. The conversations we had helped provide a sense of the harvesting that occurs in this region along with some aspects of the social determinants of health. The conversations also helped me to understand the importance of harvesting and how the impacts of climate change can affect aboriginal people beyond the aspect of providing physical sustenance. In some cases literature is cited in support of the knowledge shared. A formal study did not take place and I did not ask for information on where harvesting sites are or any other specific information.

people who have been told or have discovered where to find these plants. Following this behavior many are reluctant to share where they gather plants, especially when populations are already stressed. A common theme that arose in discussions was that some First Nations either do not know or just do not follow the teachings on how to gather plants in a sustainably to allow others to gather and let plants continue growing for future use. There are specific ways in the First Nations teachings on how to harvest plants and animals so they will continue to propagate and grow. One example is leeks and ginger root where the bulb of the former and rhizome of the latter are left so the

population is sustained and continues to grow. Other methods are to only harvest a small percentage of the plants from a large stand. For animals, they are not taken for food at certain times of the year to avoid killing a mother when she is pregnant or when the offspring are still dependent on her.

Results from the First Nations Food, Nutrition & Environment study from 2011|2012 indicate that southern First Nations communities in the same ecozone (Woodland Plains) as Saugeen First Nations and Chippewas of Nawash Unceded harvest similar foods and so they may have similar gathering and consumption characteristics (Chan et al., 2014). Of First Nations adults in Southern Ontario, the study found that fish and wild game were consumed by 55%, wild birds by 15%, wild berries or nuts by 53% wild plants by 37%, tree foods by 28%, mushrooms by 3% and cultivated traditional foods by 88% (Chan et al., 2014). A difference from the study results for Saugeen First Nation and Chippewas of Nawash Unceded may be greater consumption of morels and less cultivated foods on reserves. In the reserve communities in the Traditional Saugeen Ojibway Nation morels are popular, as are all kinds of berries and leeks, fiddleheads, puffballs, and maple sap (as syrup and not concentrated). Deer and rabbit were most commonly mentioned for meat sources but partridge, ducks, wild turkey, beaver, squirrel, frog's legs and crayfish are still harvested to varying degrees. Some are usually only eaten by elders, others are important in ceremony, and some are popular with youth harvesting food in the community. Fish are still important, but many youth in the communities are not as fond of it. Whitefish was commonly mentioned, but it is reportedly getting harder to catch. Some thought it was due to lower water levels and overall reduced fish populations, some thought the water was too warm in the shallow areas where fishing was common when the water was deeper. Salmon is not native to the lakes and is not a sought after fish, it is considered an invasive species by some. Although not as common now, gardens used to be a source of food, with some people remembering their great-grandparents, grandparents or parents, having a garden at their home. Home and community gardens are currently having a resurgence so some foods may come from them, but they do not likely contribute as much to the diet as was found in the FNFNES (Chan et al., 2014). Of important consideration are the sacred foods, trees and medicines. As explained to me, sacred foods are the strawberry, wild rice, corn, and game (venison). Sacred trees are Cedar, Maple, Birch and Ash. There are a number of plants that are very important culturally and are used in ceremonies, as offerings and as medicines. Sacred plants (tobacco, sage, and sweet grass) are important for ceremonies, offerings and as gifts. Many plants are important for medicines and general well-being. Tobacco and sweet grass are very important for smudging and offerings. Many plants have several uses, in many cases several parts of the plant are used and are harvested at various stages during the growing season. Other uses for plants, trees and animals can be utilitarian or of an artistic nature (Moerman, 2014). An example of is the ash tree that is used for basket making – from jewelry boxes to hauling baskets. Several people remembered going out in groups to harvest, and working with other families and friends to can or preserve foods. It was safer (i.e., less likely to encounter a bear in larger groups), and was considered to be a social event. Now people keep more to themselves and harvesting on the land is not felt to be the kind of group or community activity it once was. It is beyond the scope of this project to review the multitude of plants, animals, and trees and their importance. The important point is that there is a diverse range of plants that are important not only for food use, but also culturally, and many have more than one use. It is also generally recognized by the First Nations people that many different animals are dependent on the same plants that they gather, that ecosystems are intricate, any disturbance can cause a cascading change and sustainability is very important.

One example of recognition and understanding of environment was of removing a large rock from a natural area for landscaping. The rock has its own thriving ecosystem, with microorganisms, insects, moss, and other animals depending on the rock and surrounding environment as a base for nourishment and protection. Removing that rock from the natural environment disturbs the ecosystem. Putting it on a front lawn in full sun kills everything, destroys the ecosystem and leaves a void where the rock was.



Figure 8. Boulder Ecosystem

First Nations off-reserve and Metis

It was more difficult to find First Nations people off-reserve and Metis people who were willing to discuss traditional food use. Although some are still actively harvesting they may be reluctant to speak about it due to similar concerns as First Nations People on-reserve, and it could be in part due to a lack of connections and someone from the community to introduce this and this project and myself to them.

Many of the foods that are harvested are similar to what the First Nations people harvest, but there are distinct differences and unique traditional knowledge specific to the Metis culture partly due to the European influence. One such food, bannock, fry bread, or a type of scone - variations of a relatively easy to make bread using wheat flour. This was a traditional First Nations food by some reports and used flour made from roots and various plants. European influence created a reliance on flour for making fry bread (Chan et al., 2014). The concept of traditional food does vary to a certain degree and some may or may not consider the same foods to be traditional depending on their particular background, learnings, and traditional beliefs. Urban Metis people are generally less involved in traditional harvesting. This is supported by research from the Metis Research Centre based on Statistics Canada data with many tables (including confidence limits) showing lower consumption of various traditional foods by urban Metis adults and children ("Metis Research Centre," n.d.). Given that Grey and Bruce Counties are mainly rural, it is possible that many Metis people are still actively harvesting but there is currently no data available regarding how many are harvesting or the extent harvesting contributes to the diet.

Barriers

Several barriers were identified by some First Nations and Metis people in harvesting traditional foods. Knowledge of traditional food practices (how to harvest according to traditional teachings), how to prepare foods, how to store foods, and even where to find them were some thoughts as to why traditional harvesting may not be practiced. The loss of knowledge when elders have not had someone interested in learning from them was identified as one factor for loss of this type of knowledge. Other considerations are economic, people without access to vehicles or equipment necessary to gather or hunt would not be able to take part regardless of other factors. Those in poverty, suffering from addictions, or mental health issues may be less interested in learning about traditional practices. Others thoughts were time considerations, confusion over what traditional foods actually are, a lack of interest, the "complacent ease of market foods", lack of cooking skills, loss of hunting and gathering grounds due to settlement, urbanization, and industry, and some were thought to be physically unable to do it anymore due to chronic illnesses, obesity or frailty. An identified issue was also lack of appropriate housing (including enough room, appropriate counter space and equipment) for processing and storage, along with infrastructure issues such as power outages, water quality and quantity. Some of these barriers are more pressing for Neyaashiinigiimi then for

Saugeen First Nation due to the more isolated location and the inadequate water system (Philips, 2016). Many of these factors were also identified in the FNFNES as being barriers to traditional food use (Chan et al., 2014).

For those not living on a reserve a big part of it was thought to be a change in lifestyle, becoming more urbanized overall and losing the ties to the land and teachers that those who live on a reserve are better positioned to maintain. Some First Nations people thought it may be a somewhat of a hidden issue, people who are not financially secure may not want to admit they use traditional foods because they have to do so to alleviate hunger due to poverty.

The impression that I was left with was that many First Nations and Metis people are still actively harvesting to differing extents. It appears to be those who are more financially stable or are able to spend time harvesting, have an interest in traditional harvesting and traditional knowledge and that have (or have had) an elder share at least some of the traditional teachings are more active with traditional harvesting. Others may harvest some of the more common foods (i.e. leeks, morels or berries), but may not be adhering to traditional practices. This could be inaccurate given the nature of inquiry for this project although the FNFNES study does lend some support to this conclusion with many of these barriers identified (Chan et al., 2014).

Impacts: Traditional Food Use and Health

Early in the course of this project it became very clear that there are many factors beyond climate change that are important in traditional food use. Originally this report was to be limited specifically to climate change impacts on foods, but the culture of Indigenous people has developed out of close ties, a reliance on, and respect of the land and environment. There has also been many social and political factors that have impacted their culture and this close relationship with the land. As a result, the determinants of health from an Aboriginal perspective have been examined.

Impacts to Traditional Food Use

The previous discussion on climate change outlines the expected climatic change in the Grey Bruce region. It is important to keep in mind that the effects are very difficult to determine due to the complexity of ecosystems so it is very hard to determine exactly what is going to occur (Weltzin et al., 2003). Despite this, climate change is very likely going to have a strong impact on the ecosystems in the traditional territory of the First Nations and Metis People of this area and thus impact current food and cultural resources. Indeed, many First Nations People in this area are already seeing changes in the environment that could be related to climate change, such as smaller, unripe and harder to find berries, shorter and less abundant sweet grass, changes in timing of ripening and maturing of plants, lower lake water levels, less flowing water in creeks and streams, less wildlife, less fish and a general feeling that the environment is degrading. This is similar to what First Nations People are finding in other areas of Ontario and Canada (Centre for Indigenous Environmental Resources & University of British Columbia, 2006; Chan et al., 2014). Forest Fires could have an immediate impact on traditional food use for both First Nations and Metis People in the Saugeen Ojibway territory. The hunting grounds on the Bruce Peninsula are part of a large forest tract and many berries and food plants grow in or along the edges of forested areas. A loss of these lands to forest fire would decrease access to Treaty land, impact hunting through loss of wildlife that rely on forested areas for

survival, and decrease plant availability for gathering. Although regeneration of the land may provide opportunities for food resources, the discussion on climate change shows that due to various factors a new mix of tree and plant species would result and many currently harvested plants and animals may not be present (Certini, 2005; Colombo, 2008; Thompson et al., 1996). The increases in temperature and the change in precipitation amounts, frequency and intensity will impact land based ecosystems and could be contributing to the changes already being noticed by many aboriginal people in this area. Changes in rainfall intensity could affect the nutrients available in the soil and drought is an important factor for many of the commonly gathered plants as many either require or prefer moist soils to grow well (e.g., leeks, morels, fiddleheads and strawberries) (Deng & Marshall, 2015; Fuller, 2012; Leif, 2010; NC Cooperative Extension Resources, n.d.; Pilz et al., 2007). Morels are an example of this as they require very specific conditions to grow and require a food source that could arguably be affected by run-off conditions found in high intensity rain events. This could remove the organic matter that the morels depend on for growth. Some types of morels grow in association with specific trees or plants. If those plants are negatively affected by climate change the morels would suffer as well, although initially they will often fruit abundantly after a tree they are associated with dies. Morels do require the soil to warm and air temperatures to increase before growing, so warmer springs with humidity, high soil moisture and higher loads of organic matter in the soil could increase morel harvests. Morels also often fruit well after a low intensity forest fire that does not destroy a major portion of the organic matter in the soil (Pilz et al., 2007).

Larger animals that are able to migrate to find better food sources and escape higher temperatures and drier conditions will become less accessible. Animals that cannot move large distances may decline in numbers or die off making those animals less available or not available at all for First Nations and Metis people (Thompson et al., 1996). Overall the changing ecosystems as a result of changing climatic norms will more than likely stress the ecosystems within the traditional SON and HSM territories and make most of the traditionally harvested foods harder to find or unavailable. This is already a concern in some First Nations communities in southern areas of Ontario (Centre for Indigenous Environmental Resources & University of British Columbia, 2006; Chan et al., 2014).

Fish and Water

Fish, especially whitefish, are an important traditional food item for First Nations in the Saugeen Ojibway territory. They may be involved in ceremonies, social gatherings and are a traditional food that many still consume, especially elders and older adults. The SON have Treaty rights to fish in Georgian Bay and Lake Huron and have commercial fishery operations that provide some economic and employment opportunities and fish for personal consumption. The Chippewas of Nawash Unceded have a fisheries department that engages in research in partnership with the University of Guelph and collects biological data to inform decisions regarding the fishery (Chippewas of Nawash Unceded First Nations, 2014). The SON has a business management department that is intent on developing the fisheries and include processing. Neither department is active in climate change research beyond reading publically available literature, but are active in sustainability research (Johnston, 2016; Lauzon, 2016; Saugeen Ojibway Environment Office, 2014). Whitefish are a cold water species and as discussed above, are expected to be stressed by climate change. This will impact not only the availability of whitefish as a food source but also the economic loss will impact the fisheries and thus the First Nations communities. Possible increased water contamination could increase contamination in all fish, especially predator fish, decreasing their health and making them an unsafe food source (Mortsch & Alden, 2003). Indeed, the Ontario fish advisory interactive map and tables have a number of advisories for fish consumption, often involving larger fish sizes and advising lower levels of consumption or avoiding certain fish altogether for pregnant women and children under 15 years old (Ontario Ministry of Environment and Climate Change, 2015). There is

the possibility of increased number of days where commercial fishing is possible due to less ice cover, but this also limits the ability to ice fish for personal consumption. Other fish may be acceptable from a food source and commercial perspective, but where it is important to have whitefish for ceremonial purposes substitution would not be a viable option. Water contamination could also affect drinking water supplies with various chemicals and metal contamination. Toxins released from cyanobacteria blooms are an important consideration as conventional drinking water treatment is not very effective in removing the toxins (Himberg, Keijola, Hiisvirta, Pyysalo, & Sivonen, 1989; Hitzfeld, Höger, & Dietrich, 2000; Mortsch & Alden, 2003).

Impacts of Climate Change: Food Security and Health

As it currently stands, climate change is not likely to greatly impact food security for First Nations and Metis in the Grey and Bruce area. Many First Nations and Metis people in SON and HSM traditional territory still use traditionally gathered foods, but it appears that for most it is not generally a major portion of the daily diet, although this can fluctuate seasonally. This is similar to what was found by the FNFNES report for the region's ecozone (Chan et al., 2014). There may be some members of the population who rely more heavily on traditional foods and they will be impacted to a greater degree. Whether this impacts their food security significantly would largely depend upon their financial situation and ability to travel to obtain market foods. It is reportedly a \$100 round trip from Neyaashiinigmiing to Wiarton and a \$40 round trip to Southampton from Saugeen First Nations (the closest urban centres). This drastically increases costs for grocery shopping and could make it unaffordable unless a cheaper or free ride can be obtained from family or friends. Given that the median earnings and income for Aboriginal people in the Grey and Bruce area are much lower than for the general population it is possible that some people do rely on traditionally harvested foods (gathered or shared) to meet household food needs (Statistics Canada, 2008a, 2008a).

Food insecurity is likely to be an issue since it is linked with poverty. In many cases poverty leads to buying foods that are less expensive but high in calories and nutritionally inadequate. This in turn leads to physical health issues like obesity and Type II diabetes and other chronic diseases. (Earle, 2011, 2013). As discussed in the section on food security and health, food insecurity is linked with many chronic illnesses as well as mental and emotional stress.

Important in the discussion on health in relation to food in Aboriginal communities is the interference of colonialism on their diet. Before impacted by colonial influences the diet of First Nations in traditional Saugeen Ojibway territory was rich in fruits, plants and vegetables, nuts, game meats and fish. These types of foods are nutritionally dense and can have a high caloric content but require the expenditure of energy to gather. This type of diet also provides the macro and micro nutrients required for healthy growth, development, and prevention of disease and illness (Assembly of First Nations Stewardship Unit, 2007; Chan et al., 2014; Earle, 2011, 2013; Metis Centre of the National Collaborating Centre for Aboriginal Health, 2011). The access to traditional foods was severely limited for most First Nations People when they were restricted to reserves. The Government provided staple foods, but these were European influenced and greatly changed the diet of the First Nations people. Introduced were white wheat flour, sugar, salt, lard, and canned or powdered milk (Assembly of First Nations Stewardship Unit, 2007; Food Safety Network, 2009; Schmalz, 1991). The switch to a reliance on these types of market foods and decrease in active harvesting has greatly contributed to the decline in health of Aboriginal people in Canada (Assembly of First Nations Stewardship Unit, 2007; Earle, 2011, 2013). The FNFNES found First Nations People who consumed more traditional foods had greater intakes of protein, iron, zinc, vitamin D and other nutrients essential to a healthy diet (Chan et al., 2014). Other studies have shown great benefits to health of

Aboriginal people by consuming a more traditional diet from nutrient quality and physical activity (Earle, 2011, 2013). Diets composed of mainly or exclusively market foods is higher in sugar, saturated fat and sodium. These are well known contributors to obesity, diabetes type II and other chronic diseases along with the lack of nutrients contributing to deficiencies that affect healthy development and growth from conception to adulthood (Community Nutritionists Council of BC, 2004; Earle, 2011; Food Safety Network, 2009; Metis Centre of the National Collaborating Centre for Aboriginal Health, 2011). Following, if the ability to harvest traditional foods is impacted significantly the First Nations and Metis people in the Grey and Bruce area will lose the nutritional and physical benefits of their traditional foods and will be at greater risk of chronic disease. Another consideration is the possibility of increases in illnesses caused by pathogenic organisms whose vectors are expected to become more common in southern Ontario. Lyme disease is expected to increase as the tick and causative organism are expected to increase their range northward. This puts Aboriginal people who are active harvesters in Grey and Bruce counties at greater risk of contracting Lyme disease (Brownstein et al., 2005).

Traditional foods are also importance for medicines, ceremonies, and the culture of Aboriginal people (Assembly of First Nations Stewardship Unit, 2007; Centre for Indigenous Environmental Resources & University of British Columbia, 2006; Earle, 2013). Indeed, the close ties that Aboriginal people have with the environment is integral to the culture. This makes a consideration of the determinants of health in an Aboriginal context an important consideration.

Social Determinants of Health

The focus of this paper was intended to be strictly on climate change and the impact on traditional food use and health. It quickly became very clear that Aboriginal traditional food systems are an integral part of the culture and it is very difficult, and maybe not desirable, to separate them. There are other factors that affect the ability of First Nations and Metis people in this area to harvest and use traditional foods and should be considered. As such, a general description of aboriginal relationships to the environment and an overview of the determinants of health is provided. Aboriginal cultures are very diverse but there is a common theme that can be found in most indigenous cultures. This is my interpretation from conversations with First Nations people and related readings. See Appendix 2 for information naming terminology and appendix 3 for recognizing traditional and treaty lands.

Most aboriginal people understand the earth and celestial world to be a continuum. Human and ecosystem health are inseparable and they are caretakers of the earth. They have an intimate connection with the environment based upon their traditional ways of life. Their culture is interwoven with their environment and is very place-based. The culture and traditional ways have been passed down orally for generations and so the language is very important culturally. This knowledge, often referred to as indigenous (traditional) knowledge, is cumulative and added to with subsequent generations. This knowledge is often passed down through experience – the act of doing, hunting, fishing, gathering, and other traditional practices such as ceremonies. This amassed knowledge is used to understand who they are, how to function in their complex societies, and how to live and thrive as a part of the overall ecosystem - not as dominant over it. They have a holistic view of health and the environment - that one cannot be healthy if the environment is not healthy (Centre for Indigenous Environmental Resources & University of British Columbia, 2006; Food Safety Network, 2009; Parks, 2010). Sustainability is very important and many traditions around harvesting protect and promote the health and reproduction of plants and animals (LaRiviere & Crawford, 2013). The idea of family is also traditionally different in Aboriginal cultures, where extended family members

such as grandparents traditionally take on a more involved role in childrearing and teaching. Community is also very important, traditionally the well-being of communities and individuals have been interdependent (Lafrance & Collins, 2003).

The determinants of health are currently the dominant framework for the main factors that are considered to contribute to health status. Social determinants of health are considered to be the circumstances, systems, institutions, environments, and structures which influence health (from development to maintenance throughout life) (Loppie Reading & Wien, 2009). These include proximal, intermediate and distal determinants. Proximal determinants are individual level determinants and include individual health behaviours, along with the social and physical environment. Intermediate includes community level factors (community infrastructure, resources, capacities and systems). Distal determinants are higher level factors, such as historical, political, social and economic considerations (Loppie Reading & Wien, 2009; Syme, 2004). These determinants do not act in isolation, through interactions and cyclical effects they work together to determine overall health. In this case the Aboriginal social determinants of health are considered.

Proximal determinants

Proximal determinants are health behaviours (i.e. smoking, diet, exercise, alcohol intake, prenatal care), physical environments (i.e. housing, exposure to contaminants), employment and income, education and food security (Loppie Reading & Wien, 2009; Reading, 2009). In Grey and Bruce, the employment, income and education levels are lower in Aboriginal populations than they are in the general population, an indication of the inequities faced by aboriginal people (Statistics Canada, 2007b, 2007c). Employment, income and education are important, poverty creates an inability to access resources such as adequate, nutritious food. This in itself creates health issues and can limit the ability to work due to illness (chronic or acute). Associated with poverty is low self-esteem, anxiety and other mental health issues. Further, poverty is linked to increased crime, lowered social cohesion and social exclusion. Social exclusion prevents individuals from pursuing education or training and obtaining employment, it also reduces the ability to rely on social networks for help when needed (Loppie Reading & Wien, 2009). Poverty alone makes hunting difficult as the equipment and supplies required to go out on the land are expensive, so passing these skills on to successive generations is difficult if the ability to hunt is limited. Considering that Treaty Land is up the Bruce Peninsula, hunters from either reserve would have to have access to a vehicle, likely a truck, capable of hauling supplies and large game. With limited funds, the purchase and maintenance of a vehicle could be beyond financial resources for many. This was recognized as a barrier by some First Nations people. There is also the added burden of intergenerational trauma for Aboriginal people in Canada. Trauma endured by many Aboriginal people and communities due to government policy and residential schools has had lasting social, mental, emotional, and physical effects. It is a complex set of interacting factors that leads to changes in brain structure and function, increases addiction susceptibility and impairs self-regulation, self-control, coping, social and learning skills, among other effects. These factors can lead to an impaired ability to provide a nurturing environment for fetal and child development, creating the circumstances to pass the effects of trauma to successive generations (Aguiar & Halseth, 2015; Bombay, Matheson, & Anisman, 2009; Loppie Reading & Wien, 2009; Reading, 2009). The collective effect of intergeneration trauma can have a strong negative impact on families and communities (Aguiar & Halseth, 2015). The physical environment includes housing. It is well documented in literature and other sources that housing is inadequate in both quality and quantity on reserves. Mould issues are common in inadequate housing and overcrowding can exacerbate the issue (Loppie Reading & Wien, 2009). Although there is an Environmental Health Officer (EHO) from Health Canada, the EHO is reported to often only visit the reserves 3 to 4 times a year, insufficient to deal with the issues on the reserve. Despite several

attempts through phone messages and email, the EHO assigned to the reserves never acknowledged the attempts at contact. I was unable to confirm this information or determine why there is limited service by the EHO on the reserves.

Intermediate determinants of aboriginal health


Intermediate determinants are health care systems, educational systems, community infrastructure, resources and capacities, environmental stewardship and cultural continuity (Loppie Reading & Wien, 2009). Each reserve is unique and face specific issues related to intermediate determinants of health, as do Aboriginal people living off-reserve. At Neyaashiinigmiing, the community drinking water system has been assessed at high risk since at least 2011/2012. It is outdated and requires upgrading to supply safe water to the community and capacity for residential and economic development (Indigenous and Northern Affairs Canada, 2012). However, the community hasn't been provided with resources to complete the upgrade and has had to apply for a grant to fund the project. Furthermore, the government grant application required support from a neighbouring municipality to be accepted for consideration. Essentially it means the Chippewas of Nawash Unceded had to ask for permission from a neighbouring municipality to provide safe drinking water for their community (Philips, 2016).

Distal Determinants

This example leads into the distal determinants of health – colonialism, racism, social exclusion, and self-determination (Loppie Reading & Wien, 2009). The magnitude of the impact and the cascading effect colonialism has had on culture and the environment of Aboriginal people is an important root cause in the proximal and intermediate determinants of health of Aboriginal people in Canada. Self-determination is closely tied with colonialism, where the paternalistic colonial government limits self-determinism severely. These factors limit the ability of aboriginal people, and First Nations people on reserve especially, to participate in the political governance of their own social, economic and political affairs, limiting their freedom and authority (Loppie Reading & Wien, 2009) .

The health legislative landscape concerning First Nations people on reserve is very complex (Lavoie, 2013; National Collaborating Centre For Aboriginal Health, 2011). A search through various legislation regarding First Nations on reserve and reserve lands revealed a complex policy landscape involving multiple ministries, different levels of government, and various legislation, some unique to specific reserves or groups of reserves. This appears to create a policy environment that is difficult to navigate and decipher and quite likely creates inequities among the reserves (Lavoie, 2013; National Collaborating Centre For Aboriginal Health, 2011) .

Racism was not often discussed in the conversations with Metis and First Nations people, surprising considering my personal experiences while growing up in the Grey and Bruce area. Most did not feel they had experienced overt racism in the Grey and Bruce community and some felt there was more within the reserves (between the two reserves, against white people, and those that are not full-blooded Native). This could partly be because of the politically-correct environment we now live in, overt racism is generally not tolerated. One comment was that the person I was speaking with “does not look native” so they felt that was a reason for not experiencing racism in the dominant colonial community. This could be an important factor and personal experiences of racism in Grey or Bruce counties for First Nations or Metis people could be very different based on individual factors such as “looking” or “not looking” Aboriginal, education level, or employment status and type of job.



My last name is Youngblood. No, it is not native, it is an anglicized German surname (Jungeblut). My grandfather changed it, as I can imagine having a German last name was not desirable leading up to WWII. While I was growing up I was occasionally subjected to racism based on my last name. I was often told “You don’t look native” or “You don’t look like an Indian”. When I was having a hard time finding a part-time job during high school I was advised to put my picture on my resume so that prospective employers would know I was not native. One interview, set up through an Unemployment Insurance Summer Works program, went something like this:

Prospective Employer: Hello, can I help you? I have an interview scheduled shortly.

Me: Hello, my name is Krista, I am here for the interview.

Prospective Employer: Oh, you don’t look native.

Me: That’s because I’m not, my last name is anglicized German

Prospective Employer: Okay, you’ve got the job.

This is just a snippet of my experience years ago in this area. I often wondered what it was like for an aboriginal person in the area. I realize now that I was terribly naïve about racism in my youth, even with my experiences. Through this project I discovered that I had biases that I hadn’t even recognized until I learned more about First Nations and Metis people. Learning about each other is very important in breaking down barriers and recognizing biases so we can communicate and work together towards reconciliation.

Considering racism at a broader level, there is a complex set of interactions between government institutions and policies, media portrayal, the education system and the general colonial society that enables and perpetuates racism against aboriginal people. This is not generally overtly recognized, at least for those of us outside the aboriginal experience, as it is a subtle and seemingly neutral process. With lack of historical knowledge and current aboriginal context, it is difficult to recognize the discrimination (Loppie, Reading, & de leuw, 2014). The current movement to provide cultural awareness, sensitivity and competency, and further to provide cultural safety, is in response to the need to provide health care to Aboriginal (and other ethnic groups) in a manner that recognizes the colonial power structures, the power dynamics between non-indigenous healthcare providers and aboriginal people, and the historical forces acting on aboriginal health. This is also proof that racism, and at the very least a lack of cultural understanding, exists for aboriginal people in Canada. Cultural safety shifts the power dynamic allowing aboriginal people to determine what is culturally appropriate for them in the healthcare setting, while the health practitioner is able to understand the culture and communicate at a competency level where they can effectively work with the aboriginal person who is consulting with them (National Collaborating Centre For Aboriginal Health, 2013). Cultural continuity is an important factor. The transfer of traditional knowledge often takes place while “doing”, such as gathering herbs for medicine. Younger generations are taught about language and gathering

medicinal plants and other important teachings while an elder or relative gathers. The passing of knowledge occurs through teaching and story-telling which can occur during any activity from household chores to ceremonies. Disruption of cultural continuity by colonialism has disrupted families and impeded this transfer. Impacts from climate change on the environment will stress cultural continuity further. As an example, if important medicinal and ceremonial plants are no longer available in traditional territory then the associated teachings cannot be passed on, as they would be traditionally, during gathering and the traditional knowledge along with the language would be at risk of loss. The substitution of other plants for ceremonial purposes especially is not acceptable and it was reported to me that many Ojibway Elders consider transplanting or cultivating of traditional plants unacceptable.

Morels used to be gathered using baskets. When moving about, spores from the morels would fall out of the basket. When the conditions were right, more morels would grow. Now harvesters often use plastic bags or plastic containers that do not let the spores fall out. Morel harvesters have noticed that there are not as many as there used to be and contribute the use of plastic bags and containers as a major cause.



Figure 9. Morels in basket

During conversation with Aboriginal people residing in Grey and Bruce County many concerns relating to the social determinants of health were mentioned. From housing issues to lack of government support, concerns about addictions, the change in social dynamics and loss of traditional knowledge. Although not frequently discussed, when government policies or actions were considered, it was usually in a negative context and highlighted the lack of control and self-determination that has plagued Aboriginal people quite possibly since Europeans began arriving in North America, and at least since the inception of the Indian Act (Aguiar & Halseth, 2015; Kesler, 2009d; Loppie et al., 2014).

The social determinants of health do include environmental determinants of health but they are most often focused on aspects such as housing and exposure to mould and contaminants. They are also very focused on individual determinants. Considering the importance of community and environment to Aboriginal people and culture and the unique circumstances of each group, an EcoHealth perspective may be a more appropriate framework to consider health factors for Aboriginal people (Parks, 2010). The EcoHealth approach is based in the premise that human health is closely linked to ecosystem (environment and animal) health. It uses a holistic approach to understand the social, environmental and economic factors that influence human health. In this process EcoHealth brings together many different disciplines, and includes a participatory process to address human health issues. This framework strives to explain and promote health in the context of complex social and ecological interactions and considers other factors not fully recognized in the social determinants of health framework (i.e., global change and sustainability). Participation of the community and academic as well as non-academic knowledge are important and the framework supports multi-sectoral policy development, clearly required when addressing health due to the multitude of factors involved (Parks, 2010). EcoHealth in practice can be applied in a place-based manner, important given the diversity found among Aboriginal communities (Fig. 8). The ecosystem approach gives equal importance to environmental management, economic factors, and community aspirations.

Traditional methods focus more on the latter two, to the detriment of the environment (adapted from Hancock 1990) (Lebel, 2003).

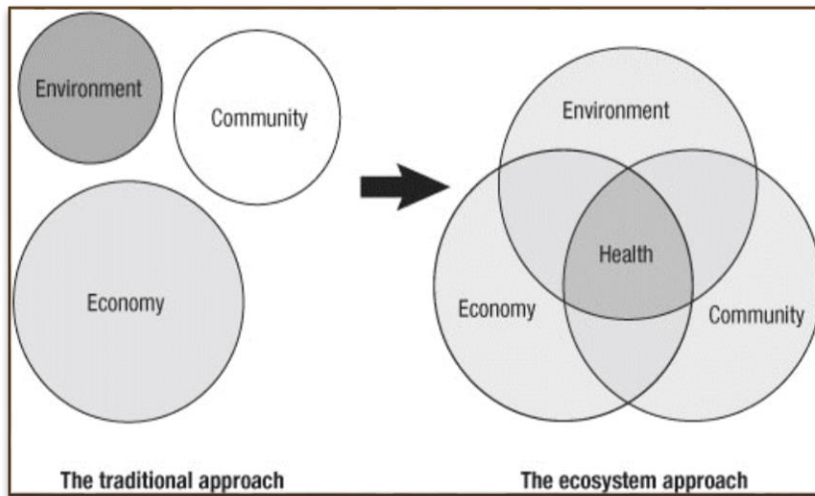


Figure 10. Traditional study framework and the ecosystem approach (adapted from Hancock, 1990 (Lebel, 2003)).

Overview: Food Security and Climate Change Initiatives

Despite the recognition of food insecurity being a significant problem in Canada, there are currently no national programs aimed at addressing food security specifically or increasing purchasing power for those suffering food insecurity due to poverty (PROOF, 2016). There are a vast number of climate change initiatives, responses and action plans from the individual level all the way up to global recognition with multi-government agreements. Various actions include cutting greenhouse gas emissions, moving to sustainable energy production, and planting trees among other mitigation and response activities See Appendix 5 for some examples of local food security initiatives and Appendix 6 for links to various climate change action plans and information.

Conclusion

It is very apparent that climate change will affect everyone, but those that are already vulnerable will be impacted to a greater degree. With the expected implications for agriculture, it is likely that food prices will increase so those who are already food insecure and those who are precariously food secure will have more difficulty in obtaining healthy food in sufficient quantity.

For the majority of First Nations and Metis people of Grey and Bruce traditional food likely does not contribute to food security to a great degree. Climate change will more likely impact their culture and overall wellbeing if they are unable to harvest important plants and animals.

Further investigation is required to determine the impacts of climate change, the strengths, vulnerabilities and opportunities for the aboriginal people of Grey and Bruce counties. Responding and adapting to climate change does provide benefit from building resilience in communities, increasing health, economic, social and environmental well-being (IPCC, 2014). In the case of First Nations and Metis people, it could also strengthen cultural well-being through traditional teachings while educating youth in environmental stewardship in respect to climate change.

Recommendations

In light of the issues surrounding climate change, food security and culture for First Nations and Metis people in Grey and Bruce Counties there are a number of recommendations that can be made. This is not an exhaustive list, as the complexity of these issues would necessitate further investigation and a multitude of recommendations to thoroughly address them.

Grey Bruce Health Unit

- 1) Consider mandatory cultural safety training for staff on the front lines and those in policy and decision making roles.
 - a. Cultural safety training will allow staff to competently provide culturally safe services and consider decision and policy impacts for the aboriginal population.
 - b. The population health team should consider addressing racism and discrimination within Grey and Bruce communities to help break down systemic barriers faced by First Nations and Metis people of Grey and Bruce County.
 - c. All staff should be trained in appropriately how recognizing First Nations and Metis communities and their traditional lands (Appendix 3).
- 2) Develop stronger relationships with the Aboriginal communities and organizations in Grey and Bruce counties.
 - a. Consider adding a representative from the Aboriginal community to the Board of Health to ensure Aboriginal perspectives are included and considered.
 - b. There is a great deal that we can learn from each other and we should be working together to develop healthier communities. Indicators for monitoring priority health concerns in these communities could be developed together for the benefit of these communities.
- 3) The GBHU should work with aboriginal communities regarding emergency response plans. There may be situations where public health may have to respond to large scale emergency situations and will have to work closely with aboriginal leaders and organizations in the community. This would be facilitated if a relationship and planning are already in place.
 - a. Develop contact lists and relationships to facilitate consultation and connectedness. This will facilitate informing and consulting with the First Nations and Metis communities about any projects or health promotion activities that could benefit them. It is also important to consider the Duty to Consult (Appendix 4).
 - b. The next update to the GBHU State of the Environment Report should include consultation with First Nations and Metis communities to include their observations and concerns regarding the environment in Grey and Bruce counties.
- 4) Define and resolve jurisdictional issues in relation to response to public health needs on reserves and advocate for defining minimum health standards for Aboriginal people in Canada.
 - a. There are no overarching health promotion or healthcare standards for reserves in Canada and the policies in place are a patchwork of agreements between reserves, federal, provincial, and local healthcare providers. This should be investigated further in order to determine if either Saugeen First Nations or Chippewas of Nawash Unceded require support from the Grey Bruce Health Unit beyond the current programs it provides and how that could be accomplished in partnership with Health Canada and any other agencies involved.
 - b. Consider putting forth a resolution, in consultation with First Nations and Metis communities, to develop minimum standards for culturally appropriate healthcare and health promotion on reserves and for Aboriginal people who are not living on reserves

- c. There appears to be much confusion by front line public health staff over what public health services are provided on each reserve, who they are provided by, and how it is decided whether the reserve, a government agency, or Grey Bruce Public Health will provide the service or funding.
- 5) Recognize climate change as a major factor in population health and work on increasing efforts to recognizing this in a local to global context. The health impacts that climate change will have on the vulnerable sector of the population, including aboriginal people, are very broad and complex. Impacts range from food security issues to emergency situations (heatwaves, flooding, power outages, drinking water quality). At this time, there is little available on the Grey Bruce Health Unit website specifically about climate change.
 - a. Develop and provide health promotion and education opportunities with respect to climate change (as mandated by the Ontario Public Health Standards) to support climate change mitigation and adaptation efforts within Grey and Bruce Counties (Ontario Ministry of Health and Long Term Care, 2008).
 - b. Evaluate climate change impacts in relevant policies and procedures of the Grey Bruce Health Unit and make changes where possible to reduce climate change impact.
- 6) The vulnerable sector is also associated with poverty. The health unit should continue to support local food security initiatives and the development of governmental policies that help address income inequity.

First Nations and Metis Communities

These are just some suggestions and examples for consideration by the First Nations and Metis Communities. Any initiatives should be culturally acceptable, community led and based upon their unique context and priorities. There are assessment and planning documents and guides available to help communities assess their vulnerabilities and opportunities in relation to climate change. See FN guide planning tools <http://www.yourcier.org/climate-change-planning-tools-for-first-nations-guidebooks-2006.html> for an example.

1. First Nations and Metis communities in Grey and Bruce counties should consider an EcoHealth or other appropriate study framework to assess climate change impacts on their traditional territories and assess how those impacts will affect their community
 - a. Use the results to develop response plans, mitigate impacts where possible, and take advantage of any identified opportunities. Climate change impact on the fisheries should be included.
 - b. Results of such studies should be reviewed for applicability to other aboriginal communities and broader policies that affect aboriginal people in Canada
2. Consider climate change in all developments and initiatives where relevant.
 - a. One example could be the water system upgrade at Neyaashiinigmiing. The possibility of lowering water levels, decreased water quality, increased mussel growth and harmful algal blooms should be considered as they may increase treatment requirements in the future.
3. One of the recommendation from the FNFNES report to improve health in First Nations communities is to increase consumption of traditional foods, which could also alleviate food insecurity. Considering the barriers to utilizing traditional foods this may be impossible for some in the current political, economic and social environment. However, the First Nations communities on reserve are uniquely poised to access their Treaty territory and traditional teachings.

- a. Determine the extent that traditional foods contribute to the diet and what barriers are preventing inclusion of these foods into the diet for First Nations on and off-reserve and Metis people of the Grey Bruce area.
 - b. Consider asset mapping of harvesting locations, especially for off-reserve locations so there is documentation of cultural importance of these locations to First Nations and Metis people. This documentation could be used to promote the preservation of these area, especially traditional harvesting sites that are not under Treaty protection
 - c. Continue building on programs that promote traditional food use and adhering to a more traditional diet, even with market foods.
 - d. Consider joining with other First Nations communities in the same ecoregion to share successes and adaptation initiatives.
4. At a broader scale, consider creating a regional or national institution to study climate change impacts, adaption, and mitigation and provide implementation training when appropriate
 - a. Ensure aboriginal involvement in local, regional, provincial and national governmental committees and working groups related to climate change to ensure Aboriginal rights and needs are represented and protected.
5. Monitor surrounding surveillance activities (i.e. Grey Bruce Health Unit and bordering municipalities) for pests and disease vectors such as the Emerald Ash Borer and the tick that carries the causative agent for Lyme disease.
 - a. Prepare response plans and educate community members in personal protection measures (i.e. Lyme disease and mosquito borne illnesses).

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Appendix 1: Glossary of Terms

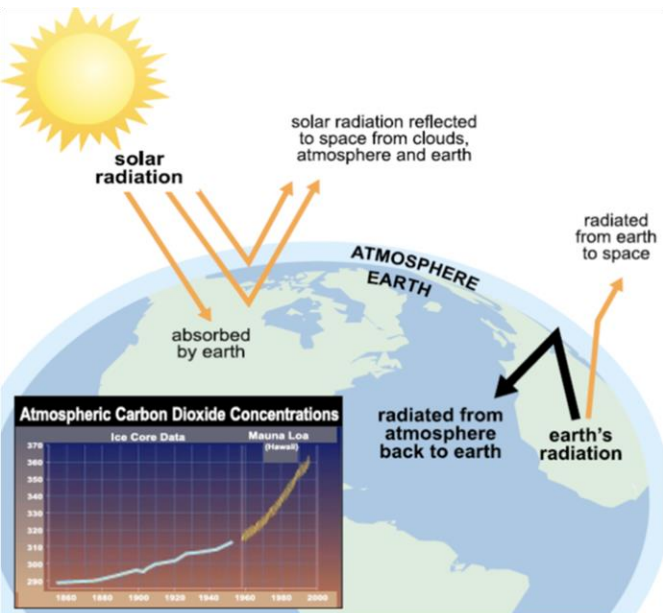
Term	Meaning
Aboriginal or Indigenous	In the context of this report means First Nations, Metis and Inuit people.
Adaptive capacity	The ability to adapt to a changing environment
Biodiversity	The variety and variability among and within living organisms
Carbon Sink	Natural (or artificial) storage of carbon for an indefinite period (i.e., trees using carbon dioxide for growth or oceans absorbing it) essentially removing it from the atmosphere.
Climate Adaptation	The process of decreasing vulnerability to climate change effects. This can be biological or social.
Climate Change	<p>“A long-term shift in weather conditions identified by changes in temperature, precipitation, winds, and other indicators. Climate change can involve both changes in average conditions and changes in variability, including, for example, extreme events” (Government of Canada, 2015).</p> <p>Any sustained change in the incoming or outgoing energy can change the Earth’s energy balance and lead to climate change. There are natural variations in climate caused by the influence of internal factors (i.e., natural variations in ocean currents) which cause short-term warming or cooling. The factors that act on this system externally are called climate forcers – they push the climate into a new long-term state which can be warmer or cooler. Changes in climate can be caused by natural forcers (i.e. volcanic activity and changes in solar radiation) or by anthropogenic forcers (caused by human activity).</p>  <p>The diagram illustrates the Earth's energy balance. It shows the sun emitting solar radiation, which is either reflected by clouds and the Earth's surface or absorbed by the Earth. The Earth then radiates energy back to space, and the atmosphere radiates back to the Earth. An inset graph shows atmospheric CO2 concentrations from 1800 to 2000, showing a steady increase from about 280 ppm to over 370 ppm.</p>

Figure 11. Ministry of Natural Resources 1998.

	<p>The main climate change forcers in effect are anthropogenic, mainly driven by carbon dioxide and other greenhouse gas emissions that began with the Industrial Revolution and increased fossil fuel use. Land clearing is also a factor, releasing stored carbon dioxide and removing vegetation such as trees that otherwise would act to remove carbon dioxide from the atmosphere. Some of these greenhouse gases are short-lived in the atmosphere (i.e. nitrous oxide). Reducing emissions of short-lived greenhouse gases have a fairly immediate effect while continued emissions sustain climate forcing. Others gases are long-lived, like carbon dioxide, and remain in the atmosphere for a long time. Some gasses have a cooling effect, but are not significant enough to offset the effect of the gasses that are enhancing Earth's natural greenhouse effect causing the general warming trend (Government of Canada, 2015).</p>
Climate Change Scenario	<p>A description of a possible future climate. Scenarios are based on assumptions how the earth's climate works, expected economic activity and population and greenhouse gas emission levels (Price et al., 2011)</p>
Climate Mitigation	<p>All efforts used to reduce or prevent climate change and its effects</p>
Colonialism	<p>Refers to the view that the white colonizers were superior over the original people of North America. The colonizers viewed their needs and their culture as more important which resulted in the creation of the institutions and policies that continue to negatively affect Aboriginal people today</p>
Earnings	<p>Earnings or employment income - Refers to total income received by persons 15 years and over during calendar year 2005 as wages and salaries, net income from a non-farm unincorporated business and/or professional practice, and/or net farm self-employment income. (Statistics Canada, 2007c)</p>
Ecosystem	<p>A community of interacting living organisms (those that produce, those that consume, and those that decompose) and non-living elements. There is no defined size and can be tiny communities up to large regions, the world itself could be considered an ecosystem.</p>
Ecozone	<p>A geographical area with similar weather/climate, vegetation and animals</p>
First Nations	<p>In the context of this report First Nations refers to the original people of this land and their descendants, living either on or off-reserve</p>

Greenhouse gas	Gasses in the atmosphere that let solar energy pass through but trap it within earth's atmosphere creating a warming effect, such as carbon dioxide (IPCC, 2014)
Hybridization	Crossing of two different organisms to create a new one that carries traits of both, such as with two different types of flowers or similar animals that are not the same such as a horse and mule.
Total Income	Refers to the total money income received from the following sources during calendar year 2005 by persons 15 years and over: <ul style="list-style-type: none"> • wages and salaries (total) • net farm income • net non-farm income from unincorporated business and/or professional practice • child benefits • Old Age Security pension and Guaranteed Income Supplement • benefits from Canada or Quebec Pension Plan • benefits from Employment Insurance • other income from government sources • dividends, interest on bonds, deposits and savings certificates, and other investment income • retirement pensions, superannuation and annuities, including those from RRSPs and RRIFs • Other money income.” (Statistics Canada, 2007d)
Isostatic rebound	The slow raising of the earth's crust after being compressed by the weight of ice sheets during the last ice age.
Median	The half-way point, as in income it would be the exact middle of the lowest to highest income.
Metis	In the context of this report Metis refers to the descendants of mixed ancestry from relations between the First Nations people and European fur traders from the 17 th and early 18 th Centuries
Phenology	Refers to the timing of life cycle events in in plants and animals and how they are influenced by seasonal and yearly changes in climate
Stratification	Occurs in the summer as a layering and separation of warmer surface waters from cooler bottom waters. The separation prevents turnover and mixing of upper and lower water preventing oxygenation of bottom waters.

Wages and Salaries

Refers to gross wages and salaries before deductions for such items as income tax, pensions and Employment Insurance. Included in this source are military pay and allowances, tips, commissions and cash bonuses, benefits from wage-loss replacement plans or income-maintenance insurance plans, supplementary unemployment benefits from an employer or union as well as all types of casual earnings during calendar year 2005. Other employment income such as taxable benefits, research grants and royalties are included.” (Statistics Canada, 2007c)

Appendix 2: Indigenous or Aboriginal?

Indigenous or Aboriginal, maybe even Indian? What about First Nations, Inuit and Metis?

Indigenous or Aboriginal? Which term should I use, if either? Are First Nations, Inuit and Metis acceptable? These are questions that are often asked and there are no easy answers. Given the historical relationship between the Canadian Government and the First People, or Original People of the Land - a term that may seem innocuous to some, while to others it may represent the damaging colonial relationship, signify power over the Original People, or have other such negative embodiments. Some may just not like a particular term while some others prefer it. Any way you look at it, a word, and specifically a name with history can be powerful and the effects can be negative or positive. All of these names, except Inuit, came from foreigners, not the original People of this land.

It is important to remember that these terms are not static. Many academic papers and grey materials have used terms that would not be accepted now. Some organizations serving all Aboriginal groups have the term First Nations in their names. Organization names may change, but the academic literature will remain with the terms that were acceptable at the time of writing. These are historical legacies and it is important to consider the content rather than the term used to describe a population.

People use these terms in different ways at different times, and in different contexts. It may mean something different to different people depending upon their experience, the context, and intent. Many Aboriginal people prefer to be identified by their own traditional community, clan, family or individual traditional names depending on the context, and preferences can vary by region. If unsure of what name to use, simply ask for guidance.

Indigenous

Indigenous is a term often used more in an international sense. It was adopted by Aboriginal leaders in the 1970's to identify and unite Aboriginal groups in the political arena. This does not just refer to Aboriginal North Americans and Aboriginal Australians, it can be used to describe a group in any country with a traditional occupation of a territory who are now under pressure from majority groups. There is no agreed upon definition but a working definition by Jose Martinez Cobo, Special Rapporteur on Discrimination against Indigenous Populations provides a concept of what it means:

” Indigenous communities, peoples and nations are those which, having a historical continuity with pre-invasion and pre-colonial societies that developed on their territories, consider themselves distinct from other sectors of the societies now prevailing in those territories, or parts of them. They form at present non-dominant sectors of society and are determined to preserve, develop and transmit to future generations their

ancestral territories, and their ethnic identity, as the basis of their continued existence as peoples, in accordance with their own cultural patterns, social institutions and legal systems.”

(Kesler, 2009b)

The issue with this term, which becomes apparent as more is learned about colonization, is that it in part defines the people in relation to the colonizers that have repressed them. This may be difficult to depart from, considering the complex history with colonizers and how these relationships have impacted Indigenous peoples throughout the world.

Aboriginal

Often Aboriginal is used to refer to Native Australians but it has become common in Canada to refer to the original inhabitants of North America and their descendants (First Nations, Inuit, and Metis). This was the definition used in the Canadian Constitution (1982) to refer to the First Nations, Inuit and Metis People of Canada. It is the most inclusive term for speaking of the First People of Canada in a general sense, although not very accepted by some First People, it is the common term in use right now.

Indian

Indian is a legal term. The Canadian Government, through law, defined who was and who was not an Indian, superseding community practices. This enabled the government to extend certain benefits and restrict rights of those that were legally defined as Indian and regulate and administer all affairs of registered Indians and reserves. This complex history and embodiment of paternalistic power makes the name very negative. Most First Nations people do not appreciate the term, but some do still use it in reference to themselves, such as an elder referring to themselves as an Indian in conversation. It is a term that for non-First Nations people should remain in the legal arena and should not be used casually.

First Nations

First Nations used to be a more general term, similar in usage to Aboriginal. It is now used in more specific terms to refer to reserve communities and their recognized members. It excludes Inuit and Metis, and in its most restrictive usage excludes non-status First Nations people. It is no longer considered to be an inclusive term to refer to the First People of Canada. Many First Nations people prefer to use their own names in reference to themselves and it can vary by region and community as to what terms and the context they are used in. It is best to ask how to refer to the community and individuals if unsure.

Metis

Metis is a term used to refer most often to descendants from the Historic Metis Nations, those offspring from the original intermarriages of European fur traders and Indians (legal term) who intermarried and created their own Nation. Using this term generally can be contentious in the Metis community, as the term is often applied loosely to anyone of mixed European and Indian ancestry whereas it is strictly meant to apply to those that can trace lineage back to a Historic Metis community, in some cases they may restrict this term specifically to those descended from the Red River communities who took part in the Northwest Rebellion (led by Louis Riel and Gabriel Dumont in the late 19th Century). Again, there are differing views and it is best to gain an understanding of how the term Metis is used in the local community in order to determine the correct context and usage.

Inuit

Inuit is a term that comes from the Inuit community and refers to the ethnic and linguistic group of First People that is found in the far North. It is a fairly stable term and likely acceptable since it is from the community and its' language. The singular form is Inuk.

Adapted from: Indigenous Foundations Course, University of British Columbia Website (Kesler, 2009a, 2009b, 2009c, 2009d)

Appendix 3: Respecting and Recognizing Traditional and Treaty Territory

When holding a meeting, convention, workshop or any such event it is good protocol to thank the host nation as a sign of recognition and respect of the relationship of the First Nations have had with the land since time immemorial. This should occur regardless of the presence of Aboriginal people at the event. For larger events it is a good idea to invite an Elder to provide an opening blessing or prayer.

You may need to thank more than one First Nation or Metis group as traditional territories may overlap.

The protocol is slightly different depending on whether it is traditional territory or treaty land on which the event takes place, and if your meeting includes indigenous people. It is respectful to recognize the traditional land and/or treaty territory before any function even if there are no indigenous groups present. If your workplace or group do not have a specific protocol to follow here are basic examples of how to thank the host nation, along with other useful tips.

Example Protocol for First Nations Traditional Territory

I would like to thank _____ for agreeing to meet with us today and for welcoming us to your traditional territory.

Example Protocol for First Nations Treaty Land

I would like to thank _____ for agreeing to meet with us today and for welcoming us to your treaty lands.

Recognizing Metis Traditional Territory

Use similar wording to First Nations traditional territory.

Useful Tips

Remember that sincerity matters. Give it your best effort and it will be appreciated, even if you do not get the particular words quite right.

If you are setting up the meeting with an Aboriginal person ask them about protocol ahead of time so you can prepare a proper greeting. If a smudging may be involved ensure the facility management is aware and make any arrangements as are necessary ahead of time.

If you do not know what nation you should be thanking or if it is treaty land or traditional territory you can ask. Friendship Centres can help you with this information, including

pronunciation, or they can help you find out who to ask (a great way to learn the pronunciation is to call the band office after hours and listen to the recording and practice saying the host nation name out loud).

If an Elder is attending to provide a blessing have someone meet them at the entrance and escort them to the meeting. You can ask someone from the band for more on Elder protocol.

For Grey and Bruce Counties the First Nations reserve hosts would be the Saugeen First Nations (Saugeen) or the Chippewas of Nawash Unceded (Neyaashiinigmiing). Off-reserve you can thank both, or the Saugeen Ojibway Nation.

The Historic Saugeen Metis traditional territory encompasses the watersheds of the Counties of Grey, Bruce, Huron, and the northern part of Lambton.

It is also important to include these groups, along with the Metis Nation of Ontario, when releasing information about events in these areas, or any other general information that is being sent to municipalities or other partners in the community. Both reserve communities have health centres and other departments that may be interested, and their contact information can be found on their respective websites.

Websites

Chippewas of Nawash Unceded: <http://www.nawash.ca/>

Saugeen First Nations: <http://www.saugeenfirstnation.ca/>

Historic Saugeen Metis: <http://saugeenmetis.com/>

Metis Nation of Ontario: <http://www.metisnation.org/>

Adapted from Working Effectively with Indigenous Peoples

<http://www.ictinc.ca/first-nation-protocol-thanking-host-first-nation>

<http://www.ictinc.ca/first-nation-protocol-on-traditional-territory>

<http://www.ictinc.ca/first-nation-protocol-on-first-nations-treaty-lands>

Appendix 4: Duty to Consult

Understanding and implementing the Duty to Consult is very important when commencing any kind of program, policy, development, project, or research that could impact Aboriginal rights or interests.

The duty to consult has been explained by the Supreme Court of Canada in various recent court cases (*Taku River Tlingit and Haida decisions in 2004*, and the *Mikisew Cree decision in 2005*). The duty to consult is essentially that the Crown must consult with any Aboriginal people whose Treaty Rights or any protection afforded by the Constitution Act (1982) may be adversely affected by a decision of the Crown. Essentially the duty to consult is triggered when Crown plans, commences, or authorizes any development, policy, or project that could potentially affect any rights of Aboriginal people, or may affect the interests of Aboriginal people. Often the duty is in some way related to development or natural resource use, but it can encompass other activities. If there is expected to be any infringement on Aboriginal rights, or interests than there is the obligation for accommodation or in some cases not allowing the project to move forward at all.

It is possible that actions Public Health may consider to research and address Aboriginal health could affect their rights. The duty to consult should be considered when research or intervention projects are conceptualized that involve or could affect Aboriginal people in Grey or Bruce County. The Saugeen Ojibway Nation, the Historic Saugeen Metis, and the Metis Nation of Ontario should be consulted to ensure that there are no adverse impacts on Aboriginal rights.

Information adapted from Saugeen Ojibway Nation Environmental Office and Metis Nation of Ontario. More information, including the consultation processes, can be found on their websites.

<http://saugeenojibwaynation.ca/>

<http://www.metisnation.org/>

Appendix 5: Food Security Initiatives

There are initiatives taking place to address food and health. Here are a few examples:

Saugeen First Nation

- Forest Garden
Trees and food plants are planted together, workshops throughout the season on various planting, harvesting, and cooking topics, a community harvest and plans for expansion to include other food production initiatives
- Market: an initiative to provide a summer market for both the first nations on and off-reserve and for tourists (due to cultural ignorance causing the declining of a grant this initiative was not able to begin when planned)
- Good food box program
- Food bank
- Community Centre: currently working on a multipurpose community centre that will house a learning centre and community kitchen

Chippewas of Nawash Unceded First Nation, Neyaashiinigiing

- Community garden: planted each spring and is harvested for the community
- Kikendaasogamig Elementary School
The school has several programs to promote healthy food and traditional foods; a food growing program (growing, harvesting), cooking classes so parents and children can learn to cook together, and has produced a traditional foods cook book.
- Good food box program
- Food bank and soup kitchen

Off-reserve

- Good food box
- Food banks
- Ontario Student Nutrition Program
- Food Security Action Group (Bruce Grey Poverty Task Force)
- Various maternal food programs
- Second Harvest - food gleaning project (Meaford area)

Appendix 6: Climate Change Initiative Examples

The following links to initiatives provide some examples of local to international initiatives with respect to climate change. Many more can be found by searching on-line.

Blue Mountain Resorts – environmental commitment

<http://www.bluemountain.ca/environment.htm>

Bruce County Federation of Agriculture

<http://www.ofa.on.ca/about/county-federation-sites/bruce/news/ofa-ready-to-take-on-climate-change>

Hazard and Risk Assessment for Province of Ontario

https://www.emergencymanagementontario.ca/english/emcommunity/ProvincialPrograms/hira/hira_2012.html#P732_41590

Ontario Ministry of Environment and Climate Change

<https://www.ontario.ca/ministry-environment-and-climate-change>

Ontario Centre for Climate Impacts and Adaptation Resources

<http://www.climateontario.ca/>

Canada's Action on Climate Change – the Paris Agreement

<http://climatechange.gc.ca/default.asp?lang=En&n=24700154-1>

Intergovernmental Panel on Climate Change

<http://ipcc.ch/>



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