# Nêhiyawak (Cree) and Climate Change in Saskatchewan: Insights from the James Smith and Shoal Lake First Nations

Jeremy Pittman*
University of Regina

*Indigenous peoples have faced and will face the challenge of adapting to change. Anthropogenic climate change, in particular, is expected to have implications for Indigenous peoples in the coming century. This paper identifies the existing sensitivities and coping capacities to climate and other external stressors of two Saskatchewan First Nation communities, the James Smith and Shoal Lake First Nations. Following the vulnerability approach, exposures and adaptive capacities are documented from community members' perspectives. These communities were selected based on their location within the transition from grassland to boreal forest, a natural region in northern Saskatchewan expected to undergo significant changes in the future due to climate change. A broad range of social, biophysical, environmental, economic and institutional stressors are found in these two First Nations communities. It is not these conditions in isolation that are beneficial or problematic; it is the combination of conditions that creates a context for vulnerability. The historical experience of First Nations people dealing with tutelage and Canadian policies not attuned to their needs has led, in part, to problems of economic dependence and unhealthy lifestyles on-reserve. Social capital and local governance are important for coping with change, but in some cases these capacities have been compromised. Indigenous knowledge and lessons from the Elders are important resources that may provide the basis for successful climate change adaptation.*

***Keywords:*** *climate change, coping capacity, exposure, sensitivity, Saskatchewan, Cree*

This climate change is becoming an issue and there is more and more concern about the impacts it is having on our society as First Nations people because of our cultural links with Mother Earth. [Climate change] has made impacts and we have to live in the environment. [The environment] is a gift. We lived in harmony with this continent for 6000 years. We choose a lifestyle that is harmonious to nature. Over the past 500 years or so, there have been changes to both our lifestyle and our ways of doing things. Yet, that characteristic of

* Department of Geography, University of Regina, Box 442, Kyle, SK, S0L 1T0, Canada.
E-Mail: jeremy.pittman@swa.ca or pittman17@hotmail.com

> our culture is still there, to preserve and protect and it will always be there over the next few years. I am just starting to understand that there are international activities going on with our cultural people to address the challenges of climate change. It is a serious matter, to the extent that there are gatherings just to comprehend and understand and to prepare, not so much a strategy, but to try and develop an interpretation for not just our immediate generations, but for everyone else.
>
> *Band Counsellor, James Smith First Nation (pers. comm., 2007)*

Changing conditions have impacted Indigenous peoples the world over, and will continue to have significant implications for society throughout the coming century. Recently, the threat of anthropogenic climate change has become apparent (IPCC, 2007; Solomon *et al.*, 2007). A general consensus has been reached amongst climate and other scientists that global temperatures have risen due in part to human activities (Doran and Kendall Zimmerman, 2009). Forecasting the magnitude of future temperature changes and subsequent implications for human and environmental systems is extremely difficult, largely because the path of human development and greenhouse gas (GHG) emission rates are impossible to predict. Problems with climate projection present another dimension to climate change risk – high degrees of uncertainty.

In addition, climate change is more than increases in temperature or shifts in precipitation regimes. It is a potential impetus for far reaching social, political, cultural, ethical and biophysical change, and will impact the ways in which people live throughout the globe. Furthermore, the proposed means of abating threats from climate change, through mitigation and adaptation, involve modifying livelihoods, lifestyles, activities, and attitudes, which will result in societal changes themselves. Many Indigenous groups are particularly vulnerable to climate change impacts due to their reliance on local environments for physical, and often spiritual, sustenance, but also due to their marginalization within global power structures as well as the inequities that exist (Salick and Ross, 2009). Sauchyn and Kulshreshtha (2008) identify Aboriginal peoples on the Canadian Prairies as one of the most vulnerable groups due to climate change.

Understanding climate change implications for Indigenous people can begin by understanding their experience in coping with multifaceted change over the past few generations. Indigenous people in Canada have been exposed to tumultuous change since their first contact with Europeans (Ermine *et al.*, 2008). The strategies they have used to cope and the sensitivities they have exhibited can provide insights into the ways climate change might affect their lives in the future. This paper discusses findings from research conducted with two *nêhiyawak* (Cree) communities in the province of Saskatchewan, Canada aiming to understand their climate change vulnerabilities. The first section of this paper outlines the approach and conceptual framework adopted in the research. Next is a brief background of each community,

followed by a discussion of the factors affecting vulnerability, and a summary of expected climate change impacts. Finally, elders' narratives regarding increasing capacities to cope with climate change and conclusions follow.

## APPROACH AND CONCEPTUAL FRAMEWORK

The vulnerability approach was used to guide this research, where current vulnerability is used as a starting point to inform an analysis of future vulnerability (Ford and Smit, 2004). Vulnerability was conceptualized as a function of exposure-sensitivity and adaptive capacity (Handmer *et al.,* 1999; Kelly and Adger, 2000; Kasperson and Kasperson, 2001; Smit and Pilifosova, 2001; Turner *et al.,* 2003; Ford and Smit, 2004; O'Brien *et al.,* 2004; Smit and Wandel, 2006). Exposure-sensitivity refers not only to the characteristics of a physical stimulus affecting a community, but also the characteristics of the community making it sensitive to or at risk from the stimulus (Smit and Pilifosova, 2003). Adaptive capacity is the ability of the community to manage stresses caused by exposure to some physical stimulus (Wheaton and McIver, 1999; Bryant *et al.*, 2000; Yohe and Tol, 2002; Füssel and Klein, 2002; Smit and Pilifosova, 2003). Vulnerability results from the interaction of social, political, environmental, climatic, cultural, economic, governance and institutional conditions internal and external to the community, and is dynamic over time (Handmer *et al.,* 1999).

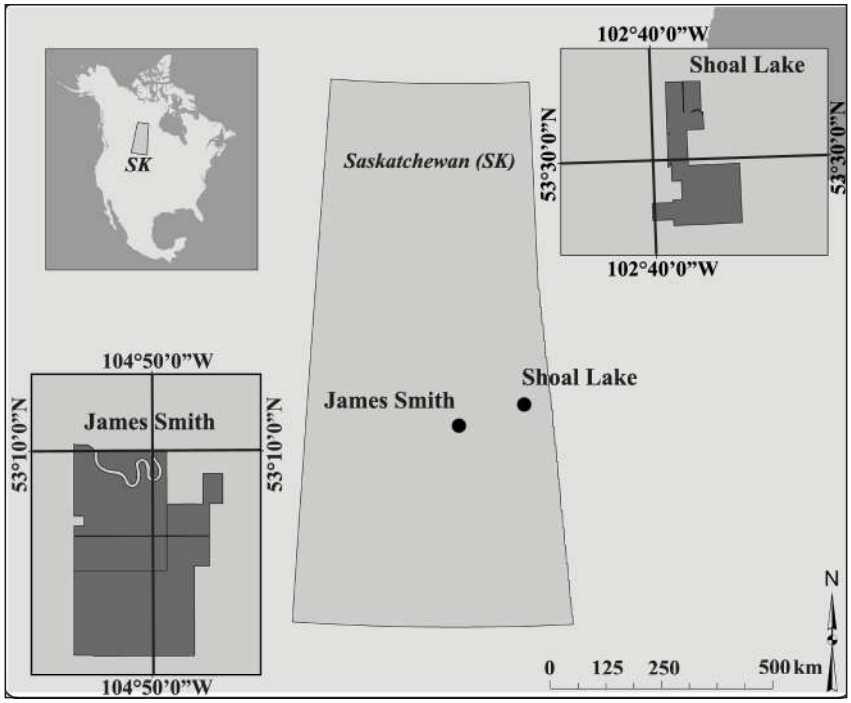
Due to the complexity of the conditions affecting local people, participatory research techniques were chosen (Ford and Smit, 2004; Ford *et al.*, 2008; Bridges and McClatchey, 2009; Turner and Clifton, 2009). Participatory techniques are useful in understanding the climate impacts in a social context, and the role of social conditions in creating climate vulnerabilities (Ford and Smit, 2004). Also, participatory research allows for climate vulnerability to be assessed from the bottom-up, not from the top-down, which is well suited to the objectives of this research (Smit and Wandel, 2006). According to Petterson *et al.* (2008) and Catto and Parewick (2008), effectively working with indigenous groups requires actively engaging and involving them throughout the research. As such, community members played integral roles in the design, conduction and completion of the research. Seventeen semi-structured interviews were conducted with members of each community, for a total of thirty four interviews, which were digitally recorded and later transcribed. Transcriptions were coded for themes relating to exposure-sensitivity and adaptive capacity using NVivo 2.0 software for qualitative data analysis. After the completion of the preliminary analysis, an Elders circle was hosted in each community, in conjunction with the *Nikan Oti* research project, in order to discuss and ground truth the initial results. Elders circles are similar to focus groups, but have a ceremonial aspect connected to them. They have been used in similar research to characterize climate change vulnerability of Indigenous peoples (Ermine *et al.,* 2005, 2007, 2008). Insights gained from the Elders circles were used to complete a second round

of analysis. Following this, another set of Elders circles were held in the communities, focusing on future adaptive capacities and strategies for augmenting these.

## CONTEXT

James Smith and Shoal Lake are located in central Saskatchewan (Figure 1) in an ecological transition area between boreal forests to the north and grasslands to the south. James Smith is traditionally a Plains Cree band who signed into Treaty Six in 1876, while Shoal Lake is primarily a Swampy Cree band, signing Treaty Five in 1875. Reserves were originally to be agricultural areas set aside to aid First Nations people in the transition from hunter-gathers to farmers. James Smith reserve is 162 $km^2$ and Shoal Lake is 15 $km^2$. Due to the inadequacy of Treaty Five land for farming, Shoal Lake is actually located outside of Treaty Five territory (Raby, 1972).

**Figure 1:** Location map of communities.




Climate normals (1961 to 1990) for James Smith indicate that temperature peaks in July, averaging 18°C, with the coldest temperatures occurring in January, averaging -21°C (National Climate Archive, 2005). Average maximum daily temperature is below freezing until April, after which it remains above 0°C until November

(National Climate Archive, 2005). The community receives an average of 424 mm of precipitation annually (National Climate Archive, 2005). Highest precipitation amounts are in June and July with the bulk of the precipitation falling in summer (National Climate Archive, 2005). Community-identified problematic extreme events include heavy precipitation, strong winds, flooding and periods of low flow down the Saskatchewan River.

There are similar trends in climate normals (1961 to 1990) for Shoal Lake. Variations in monthly average daily temperatures range from approximately -20°C in January to +17°C in July (National Climate Archive, 2005). Average daily maximum temperatures are above 0°C from April to November (National Climate Archive, 2005). Shoal Lake receives approximately 445 mm of precipitation annually, most of which occurs in the summer with highest monthly averages in June and July (National Climate Archive, 2005). Extreme events identified as problematic by community members include floods and strong winds.

## FACTORS AFFECTING VULNERABILITY

### *Echoes From the Past*

As noted earlier, vulnerability is dynamic over time. Past events have implications for current vulnerability, as they contribute to the emergence of conditions communities face. Of particular importance to current vulnerability in the study communities is *ê-mâyahkamikahk* ('where it all went wrong') or the Northwest Rebellion of 1885 (McLeod, 2007). Facing starvation as the buffalo disappeared, European-brought epidemics, and disempowerment within the rapidly changing 'New World', a handful of young First Nations men took up arms against Euro-Canadian settlers at Frenchman's Butte, Cutknife and Batoche. This revolt, although directed towards abating colonialism, in fact strengthened the colonialist movement by giving colonial powers the so called 'justification' they needed to force First Nations people further into spatial, spiritual and cultural exile (McLeod, 2007).

Following *ê-mâyahkamikahk*, Canadian assimilationist policy worsened (Dyck, 1991; McLeod, 2007). Although missionaries and others had been attempting to convert, or 'civilize', Indigenous people for centuries, the events of 1885 solidified their aims (Dyck, 1991; McLeod, 2007). *nêhiyawak* would now have to face residential schools and the shattering residual effects they had on family, community, and culture. During this research, residential schooling would often come up in conversations with the Elders, who would, at times, be moved to tears when remembering all that they lost as a result of their imprisonment in the residential schooling system. Particularly significant to the Elders were the tensions within communities, disintegration of traditional family structures and means of raising children, and erosion of cultural practices and languages they seen resulting from residential

schools. Important to note here, however, is the way in which Elders would discuss the negative impacts of residential schools alongside any positive impacts they perceived, such as gaining valuable skills and knowledge while at the schools despite the sometimes harsh treatment. Their ability to stay positive is a testament to their strength, and an important capacity to cope with change. Reliance on values, beliefs, and internal human capacity to stay strong and positive in the face of change has been documented as an important coping strategy within these communities in other research as well (Ermine *et al.*, 2007).

Compounding with residential schooling, the *chakastaypasin* people had further stress to cope with as a result of *ê-mâyahkamikahk* – the loss of their reserve. Many *chakastaypasin* people now make their home on the James Smith reserve, but it was not always this way. *chakastaypasin* had their own reserve at one time, further west up the Saskatchewan River from James Smith close to what is presently the town of Birch Hills, Saskatchewan. Although it was unclear if any took part in the violence, *chakastaypasin* people were accused of involvement in the Northwest Rebellion, and as such, were said to have forfeited their lands (ICC, 2005). Their reserve was wrongfully appropriated and sold to Euro-Canadian settlers, while *chakastaypasin* people were amalgamated into the reserves to which they fled – mostly James Smith and Cumberland House – as they attempted to avoid the ensuing violence. The migration of *chakastaypasin* people to the James Smith reserve has caused tensions within the community that still exist today.

### *Perceived Inferiority and Coercive Tutelage*

The perceived inferiority of Indigenous peoples in Canada by Euro-Canadians is well documented and has shaped the nature of many interactions between these two groups (Dyck, 1991). When Europeans first arrived in what is now Canada they sought economic partnerships with First Nations people, but also wished to teach them the 'civilized' way of life (Dyck, 1991). Many Euro-Canadians with good intentions have since attempted to lead First Nations peoples down the road to 'salvation', but have in fact helped to create many of the problematic situations in which First Nations people currently find themselves (Dyck, 1991).

Coercive tutelage over the last few centuries has brought First Nations people face to face with many challenges, including cultural segregation and identity loss (McLeod, 2007). The failure of Euro-Canadians to respect the beliefs and lifestyles of their hosts in the New World places First Nations people at a disadvantage within dominant Canadian culture (Dyck, 1991; McLeod, 2007). Euro-Canadians sought out to teach and to 'help' First Nations people to overcome their 'savage' lifestyles without recognizing the full value of First Nations' knowledge and ethics (Dyck, 1991). Many of the damaging programs, such as residential schooling, were a result of the desire to 'teach' (Dyck, 1991).

Furthermore, Canadian federal policies not attuned with the needs of First

Nations people have been historically problematic (Morito, 2002). The failure of reserve agricultural programs in the late 1800s was mostly caused by limited provision of implements and other technologies required for agriculture on the Prairies. A general lack of agricultural experience in such dry and variable conditions, both within First Nations and Euro-Canadian populations, also played a role in the agricultural programs' collapse (Dyck, 1991). It was not the laziness of First Nations people as some Indian Agents of the time would have you believe. Federal policy overlooked the necessity and value of independence and empowerment of First Nations groups. Although some First Nations leaders on the Prairies at the time, such as *mistahi muskwa* (Big Bear), attempted whole-heartedly to make the federal government aware of his peoples' needs, his resistance of treaty was eventually crushed as starvation due to the disappearance of the buffalo forced him to sign in order to sustain his people.

### *Social Capital*

Social capital is a well-documented factor in determining adaptive capacity (Adger, 2001). It is not a measure or amount of social capital that is important for building adaptive capacity, but rather specific arrangements allowing people to come together and collectively face their challenges (Adger, 2001). Social capital is based on trust and reciprocity that exists between individuals within a community, between communities and outside agencies or organisations, and between communities and external governing institutions (Adger, 2001; Mignone and O'Neil, 2005).

An Elder from James Smith discusses the tension and mistrust between community members on-reserve (pers. comm, 2007):

> Long ago this used to be a close knit reserve. With myself and my family, there is only two of us now, but there used to be 8. We weren't close. We were not the people that hug and I love you and all that. You didn't get that in residential school. I never lost my language. I didn't lose that. They let us talk our language in one school. At high school in Lebret, we spoke English, but we spoke Cree anyway. There were a lot of languages there, Chipeweyan, Cree, Lesotho. Most of my friends talked Cree. Some people wanted to teach me Saulteaux. I learned some. There is a lot of effect on us. There is always a tension on this reserve. We are kind of fighting amongst each other. There are certain families that don't like each other because of last name. You don't belong here. We get the jobs. You get the second jobs. I am down on a last name basis. I am chakastaypasin. That is the one close to Fenton. It is not a town anymore. It was close to Birch Hills, by the ferry. That is where we are from. We left that reserve on account of the 1885 rebellion. They were trying to recruit our people to the Métis against the government. The Métis told us that if we didn't join them they would kill us off. That is why we came over here. People went all over the place from over there. That is the history I know

> from there. That is pretty well how things stand now- a-days here. Hopefully it changes. You don't know who your friend here is anymore. Me, I have a good idea who. Would I say that I have friends from other bands? Ya, I got friends. Even some reserves, I have met some of my relatives from chakastaypasin. They are all over the place. They married a woman and stayed. There is another family next reserve that was from there. We finally found them. But that is how it is here. It is pretty hard. Hopefully things change now.

Apparent from the above narrative is the fact that social capital in James Smith is not functioning to increase coping capacity. Divisions within the community caused by residential schooling and the amalgamation of multiple bands onto one reserve have limited the effectiveness of social capital in dealing with change. In contrast, Shoal Lake successfully employs social capital to cope with multifaceted change by hosting an annual Family Camp (Pittman *et al.*, 2009). Family Camp is a weeklong event where community members go camping in the forest. The camp is designed to teach youth traditional skills and values to aid them in their daily struggles. This event helps community members cope with change, but also serves to increase social capital within the community by fostering trusting relationships of reciprocity (Pittman *et al.*, 2009). Positive effects of the camp, however, in some cases are short lived when the community returns to the reserve (Pittman *et al.*, 2009).

### *Local Governance*

Local governance is important in determining vulnerability to climate change (Pittman, 2009a). James Smith is currently under third party management, meaning local band governments no longer have absolute control over Indian and Northern Affairs Canada (INAC) funding allocation. The funds are allocated by a third party manager appointed by INAC due to previous mismanagement of funds by the James Smith Chief and Council. Community members and band councillors reported that important projects, such as recreation and infrastructure maintenance, sometimes are not funded and the community has less say in which projects are favoured. Third party management can have serious implications for climate change vulnerability and adaptation, as impact mitigation and community led initiatives may not be funded due to prioritization of debt-reduction. According to a Band Counsellor, an example is the degradation of the culvert and drainage system within the community due to a lack of maintenance, which resulted in flooding during 2007 (pers. comm., 2007).

James Smith also has three band governments operating on-reserve. In order to pursue separate land claims, the James Smith, Peter Chapman, and *chakastaypasin* bands decided to split their leadership. Although the move was an important strategy to secure adequate land resources for community members, there has been much unrest over the split, which has subsequently led to depleted social capital. "It is so bad. This is a new thing since we split into three bands. When we were one

band people had more say. We had band assemblies. Now they are scared," said a local hunter (pers. comm., 2007). Political divisions, in-fighting and a lack of accountability were brought up by community members throughout the interviews, which all serve to reduce the ability of the community to deal with various stressors. Potentially, this situation is worsened by imposed ideas of private ownership in First Nations communities. Negotiations with an impending diamond mine on traditional lands were hindered by political issues on-reserve.

Shoal Lake has a more unified Chief and Council and is not under third party management. They have similar problems obtaining adequate funding, but have been able to mobilize to address these issues creatively. The community participates in many research projects with outside universities and agencies, which allows them to secure funding to conduct programs aimed at improving health and living conditions on-reserve. Due to their proper management of funds in the past, it is easier for them to get funding and loans from outside organizations, such as Canadian Mortgage and Housing Corporation (CMHC). Coping capacities are increased by their local governance.

### *Dependence*

Problematic for both communities is their economic dependence on federal transfer payments. Few economic opportunities exist locally and, despite efforts to develop local industries, there are few income generating activities taking place on-reserve. Many individuals rely on social assistance to support themselves. Elders in James Smith are particularly saddened by the effect the welfare system has had on their people (Ermine *et al.,* 2008). The work ethic once used by the 'old people' to cope with a variety of challenges is threatened when social assistance programs are allowed to foster economic dependence (Ermine *et al.*, 2008). Without the struggle to survive, local community members are never forced to develop skills, knowledge and their human capacity to cope with adversity.

### *Violence, Gangs and Substance Abuse*

Youth reliance on drugs and alcohol, as well as participation in gangs and violence, are concerns in both communities. Shoal Lake Elders are particularly disturbed by the actions of their youth and often become emotional when discussing this topic. Many negative actions of the youth are seen as maladaptation to the tumultuous social, political and cultural change experienced by *nêhiyawak* over the last few generations (Ermine *et al,* 2008). Elders and other community members are concerned about the effect maladaptation has on community capacities to cope with future change. The following quote from a young community member of James Smith (pers. comm., 2007) helps characterize the situation: "They're alright when they're sober, but when they get drunk they [have] to prove themselves. They [have] to hurt somebody. People just want to kill, kill, [and] kill!" When under the influence

of drugs and alcohol, many community members become caught in a destructive cycle. They fail to build their personal capacities to cope with change, and as such, reduce the capacity of the entire community to cope with change. Furthermore, the violence resulting from substance abuse often causes fear, which diminishes social capital and collective action.

## INDIGENOUS KNOWLEDGE TO COPE WITH CLIMATE AND WEATHER

> "...the river is very shifting. It is everlasting sliding from the gravel pit down along that way. I saw the whole horseshoe bend under ice in 1947. The river jammed up in some place. The ice must have come up 60 or 70 feet. It cleaned up all the trees. As far as the gravel pit it was under ice...my old man was living over there by the gravel pit. He had a little shack there and then he had his little barn dug in along the hole there. He kept his horses there. He had a dream. These little people told him to move; move now because next spring this place is going to be flooded by ice. He followed his dream and he moved out of there - where Walter Constance is living now – that's where he moved Indians usually do that. They follow their dream. There is something in it."
>
> *Elder, James Smith First Nation (pers. comm., 2007)*

There definitely is 'something in' the application of Indigenous knowledge (IK) to cope with climate and weather. IK has been employed throughout history to successfully survive in environments spanning the world over. *nêhiyawak* have used knowledge developed over, and passed down through, many generations to successfully cope with a wide array of environmental stressors. IK practitioners at the local level have a good handle on the ways in which IK can be used to cope with extreme weather and climate events – they have been doing it for millennia.

There are many individuals who possess IK in both communities despite concerns over cultural loss (Pittman, 2009b). IK is inherently dynamic in nature (Berkes, 2008) and responsive to the necessities of the user (Willie Ermine, pers. comm., 2009). Many Elders have observed changes in the knowledge of their people and the ways it is employed to survive. As is apparent from this statement by an Elder of James Smith (pers. comm., 2007), modern lifestyles have impacted IK and its absorption by local people:

> When I was about 3 or 4 years old, I went with some Elders. My dad used to have horses and we took these Elders out one spring, out east by the forestry. There used to be a lot of maple trees and all that and that's where they got their maple sugar from. I haven't been there for a while. I'd probably get lost

> because I wouldn't know where it is. I think I have a good idea where it is. I suppose the old wagon trails are gone. It [the forest] is almost all cut down that way. It shouldn't be hard to find the maples. We even had some just down the hill where they used to do that. Even that is all gone. Nobody does that anymore here. They don't know how to do it. Nobody showed us. They figured when the sugar was in the store that they didn't need it anymore. But if you go to Red Earth there are some people that know how to do that. I don't know their names. You will find somebody there that knows how to do that.

Despite this, IK continues be employed by individuals in both communities to cope with environmental stressors in a spiritual context.

## ANTICIPATED IMPACTS OF CLIMATE CHANGE

Coping with climate change will involve both proactive management of anticipated impacts as well as reactive management of those unanticipated. Dealing with uncertainty will be necessary in climate change adaptation, due to the limited skill of numerical and empirical models at regional scales. Model output can be used in decision support, but should not be relied upon as precise predictions. Model information must be integrated within a social context to fully understand climate change implications for a particular region.

According to a recent synthesis report by Sauchyn and Kulshreshtha (2008), water scarcity poses the most significant risk due to climate change on the Canadian Prairies. Increasing aridity, more frequent and severe droughts, and reduced streamflows are among the anticipated impacts of climate change for the region (see Sauchyn and Kulshthrestha, 2008). The South Saskatchewan River, a major supplier of water for irrigation, consumption, recreation, hunting, fishing, hydro-power generation, and industry, is expected to undergo mean annual stream flow reductions of 8.5% at Lake Diefenbaker (Pietroniro *et al.,* 2006). Both the James Smith and Shoal Lake communities are located within the Saskatchewan River Basin, making the threat of future water stress apparent.

Both Shoal Lake and James Smith are located in a transitional vegetation zone. In areas characterized by transitional vegetation, or areas that act as buffers between two different ecological regions, vegetation shifts are expected due to climate change (Wheaton, 1997; Saporta *et al.*, 1998). For the focal area of this research, future climates are expected to favour grasslands over boreal forest, and a northward migration of the tree-line is anticipated (Kulshreshtha *et al.*, 2001; Johnston *et al.*, 2001; Johnston, 2008). It is unlikely that a gradual shift in vegetation will be observed, but rather drastic shifts driven by annual climate variability manifesting in forest fires, pest outbreaks and drought (Kulshreshtha *et al.*, 2001; Johnston *et al.*, 2001; Johnston, 2008). Ecosystem changes will likely have implications for spiritual and

cultural ties to the land, as well as resource use, within the communities.

There is also the potential that resource competition could exacerbate water- and forest-related stresses. As water and lumber become more and more scarce increased competition over these resources is likely. Historically, First Nations people have been marginalized from resource control. Higher levels of resource competition could potentially marginalize First Nations people further. Existing inequities are at risk of becoming further engrained due to climate change.

## LESSONS FROM THE ELDERS

The following section showcases Elders' narratives on building capacities within their communities. Contained within the narratives are knowledge and lessons that can be applied far beyond the boundaries of the reserves, and may be applicable for climate change adaptation worldwide. The first narrative comes from an Elder from Shoal Lake as he reflects on human capacities (pers. comm, 2007):

> My grandfather asked me one morning what I was going to do, and I told him nothing; I don't have anything to do. And he said,"Grandson, look around the log house. You will see something to do and go outside and look around. There are a lot of things you can do outside in the bush. So don't ever say that you have nothing to do." Use the brain, the mind and the movement, and you will strengthen.

A similar lesson comes from another Elder from Shoal Lake (pers. comm, 2007):

> If you don't want to work for yourself then you are going to get hungry. You have to work hard. That's what happened to us. They [Federal Government] gave us a ration...$2 per month. That's nothing. We trapped all winter. There used to be a good trapping for mink. You could get $85 for one mink, sometimes $185. Moose hide; you had to work hard to make a moose hide. Take the skin off and the meat out and dry the moose hide with fire. Then you have to scrape it. And you can make moccasins from it. That's where we got money from then. We smoked that moose hide. We sold moccasins in the store, but we don't have moccasins anymore.

Another key capacity in terms of climate change adaptation will be the ability to deal with uncertainty (Hallegatte, 2009). Remaining flexible in decision making, as well as building capacities to cope with a wide range of possible changes are useful adaptive strategies (Hallegatte, 2009). The following narrative from an Elder from James Smith (pers. comm., 2007) is a strong statement regarding the dynamics of life and coping with uncertainty:

> [Climate change scenarios show that the forest may disappear in this area. What sorts of problems do you foresee for your children or grandchildren in the future if this happens?]
>
> I guess I'd have to say that everything you have said is going to happen. But I want to tell them that someday there is going to be a change in this world, and you don't know what that change is going to be. But there is going to be a change. It's pretty hard to say if that's going to be tomorrow or next week or next year.

An Elder from James Smith (pers. comm., 2007) elaborates on his ideas about values and how faulty priorities can lead to big problems, such as climate change:

> It's probably the almighty dollar! Everybody is trying to make money and they forget about Mother Nature. Now they see that. They see that they have done wrong. I don't know if it is too late to do something about it, but the way I see things now, I think, well they might save it and they might not. It depends on whether or not the people want to work hard at it.

The importance of a strong work ethic is a predominant theme among the narratives and it will take 'hard work' to face the challenges of climate change. Also, the ability to recognize change is inevitable and to embrace the uncertainties brought by change are important for climate change adaptation. Valuing 'Mother Nature' may also be an important ideological change necessary for successful climate change adaptation.

## CONCLUSIONS

Canadian First Nations people have been faced with social, cultural, political, and economic change over the last few centuries. This trend is likely to continue as climate change is anticipated to impact many aspects of First Nations' life. Despite depletion of social and human capital, First Nations people have demonstrated resilience and adaptive capacity when facing disturbance from multifaceted stressors. Vulnerability to the negative impacts of climate change is largely related to historic events, such as the Northwest Rebellion of 1885, and Euro-Canadians' attitudes and values towards First Nations people. Social capital, local governance, and IK were found to be important resources that can be used for coping with change. Some exposures expected to have compounding effects with climate change impacts are economic dependence, violence and substance abuse. Despite this, Elders wish to pass on the importance of working hard, accepting uncertainty and valuing healthy environments – strategies that could facilitate adaptation to climate change.

**ACKNOWLEDGEMENTS**

This research would not have been possible without the support of the James Smith and Shoal Lake community members. Their experience and knowledge were used in this investigation**.** The researcher would like to thank all those who took the time to make him feel welcome and help him understand the experiences of local people.

**REFERENCES**

Adger, N. (2001) Social capital and climate change. Tyndall Center Working Paper No. 8, Norwich, England.

Berkes, F. (2008) *Sacred Ecology.* New York: Routledge.

Bridges, K. and McClatchey, W. (2009) Living on the margin: Ethnoecological insights from Marshall Islanders at Rongelap atoll. *Global Environmental Change*, 19(2): 140-146.

Bryant, C.R., Smit, B., Brklacich, M., Johnston, T.R., Smithers, J., Chiotti, Q. and Singh, B. (2000) Adaptation in Canadian agriculture to climatic variability and change. *Climatic Change*, 45(1): 181-201.

Catto, N.R. and Parewick, K. (2008) Hazard and vulnerability assessment and adaptive planning: Mutual and multilateral community-researcher communication, Arctic Canada. *Geological Society, London, Special Publications*, 305: 123-140.

Doran, P.T. and Kendall Zimmerman, M. (2009) Examining the scientific consensus on climate change. *Transactions, American Geophysical Union*, 90(3): 22-23.

Dyck, N. (1991) *What is the Indian 'Problem'*. St. John's: The Institute of Social and Economic Research.

Ermine, W., Sauchyn, D. and Pittman, J. (2008) Report Nikan Oti: The Future – Understanding adaptation and capacity in two First Nations. Ottawa: Climate Change Impacts and Adaptation Program.

Ermine, W., Sauchyn, D., Vetter, M. and Hart, C. (2007) Report Isi Wipan – Climate: Identifying the impacts of climate change and capacity for adaptation in two Saskatchewan First Nation communities. Ottawa: Climate Change Impacts and Adaptation Program.

Ermine, W., Nilson, R., Sauchyn, D., Sauve, E. and Smith, R. (2005) Report Isi Askiwan – The State of the Land: Prince Albert Grand Council Elders Gathering on Climate Change. Ottawa: Climate Change Impacts and

Adaptation Program.

Ford, J., Pearce, T., Gilligan, J., Smit, B. and Oakes, J. (2008) Climate change and hazards associated with ice use in Northern Canada. *Arctic, Antarctic, and Alpine Research*, 40(4): 647-659.

Ford, J.D. and Smit, B. (2004) A framework for accessing the vulnerability of communities in the Canadian Arctic to risks associated with climate change. *Arctic*, 57(4): 389-400.

Füssel, H.M. and Klein, R.J.T. (2002) Assessing vulnerability and adaptation to climate change: An evolution of conceptual thinking. Havana: UNDP Expert Group Meeting on Integrating Disaster Reduction and Adaptation to Climate Change, June 17-19, 2002.

Hallegatte, S. (2009) Strategies to adapt to an uncertain climate change. *Global Environmental Change*, 19(2): 240-247.

Handmer, J.M., Dovers, S. and Downing, T.E. (1999) Societal vulnerability to climate change and variability. *Mitigation and Adaptive Strategies for Global Change*, 4(3-4): 267-281.

Indian Claims Commission (ICC) (2005) *James Smith Cree Nation: Chakastaypasin IR 98 Inquiry*, available online at: http://www.indianclaims.ca/pdf/james_smith_IR98A.pdf, accessed May 20, 2009.

Intergovernmental Panel on Climate Change (IPCC) *Climate Change 2007: Synthesis Report*, Cambridge: Cambridge University Press.

Johnston, M. (2008) *Impacts of Climate Change on the Island Forests of Saskatchewan*. Saskatoon: Saskatchewan Research Council, 12168-1E08.

Johnston, M., Wheaton, E., Kulshreshtha, S., Wittrock, V. and Thorpe, J. (2001) *Forest Ecosystem Vulnerability to Climate: An Assessment of the Western Canadian Boreal Forest*. Saskatoon: Saskatchewan Research Council, 11341-8E01.

Kasperson, R.E. and Kasperson, J.X. (2001) *Climate Change, Vulnerability and Social Justice*. Stockholm: Stockholm Environment Institute, Risk and Vulnerability Programme.

Kelly, P.M. and Adger, W.N. (2000) Theory and practice in assessing vulnerability to climate and facilitating adaptation. *Climatic Change*, 47(4): 325-352.

Kulshreshtha, S., Johnston, M. and Wheaton, E. (2001) *Forest Ecosystem Vulnerability to Climate Change: Conceptual Framework for Economic Analysis*. Saskatoon: Saskatchewan Research Council, 11341-4D01.

McLeod, N. (2007) *Cree Narrative Memory: From Treaties to Contemporary Times.* Saskatoon: Purich Publishing, Ltd.

Morito, B. (2002) *Thinking Ecologically*. Canada: Fernwood Publishing Co.

Mignone, J. and O'Neil, J. (2005) Social capital as a health determinant in First Nations communities. *Journal of Aboriginal Health*, 2(1): 26-35.

National Climate Archive (2005) Canadian Climate Normals or Averages 1961 to 1990. Ottawa: Environment Canada, Accessed: March, 2008, Available online at: http://climate.weatheroffice.ec.gc.ca/climate_normals/index_1961_1990_e.html.

O'Brien, K., Eriksen, S., Schjolden, A. and Nygaard, L. (2004) What's in a word? Conflicting interpretations of vulnerability in climate change research. Oslo: Center for International Climate and Environmental Research (CICERO), 2004:04.

Petterson, M.G., Tolia, D., Cronin, S.J. and Addison, R. (2008) Communicating geosciences to indigenous people: examples from the Solomon Islands. *Geological Society, London, Special Publications*, 305: 141-161.

Pietroniro, A., Demuth, M., Dornes, P., Toyra, J., Kouwen, N., Bingeman, A., Hopkins, C., Burn, D. and Brua, B. (2006) Stream flow shifts resulting from past and future glacier fluctuations in the eastern flowing basins of the Rocky Mountains. NWRI Internal Publication, Contribution Number 06-026, Fountain Valley, CA: National Water Research Institute.

Pittman, J. (2009a) The Vulnerability of the James Smith and Shoal Lake First Nations to Climate Change and Variability. Las Vegas: Association of American Geographers (AAG) Annual Conference, March 22-28, 2009.

——, (2009b) Coming to know: My experience with traditional knowledge as a *wêmistikôsiw* in the land of the *nêhiyawak*. University of Guelph, Invited Talk, March 20, 2009.

Pittman, J., Cook, E., Diaz, P. and Sauchyn, D. (2009) Coping with Change - Family Camp at the Shoal Lake Cree Nation. In Oakes, J., Riewe, R. Cogswell, A. (eds.) *Sacred Landscapes*, Winnipeg: Aboriginal Issues Press, pp. 207-214.

Raby, S. (1972) Indian Treaty No. 5 and the Pas Agency, Saskatchewan, N.W.T. *Saskatchewan History*, 25: 92-114.

Salick, J. and Ross, N. (2009) Traditional peoples and climate change. *Global Environmental Change*, 19(2): 137-139.

Saporta, R., Malcolm, J.R. and Martell, D.L. (1998) The impact of climate change on Canadian forests. In: Koshida, G. and Avis, W. (eds.) *Responding to Global Climate Change: National Sectoral Issue*. Ottawa: Environment Canada, pp. 319-382.

Sauchyn, D. and Kulshreshtha, S. (2008) Prairies. In: Lemmen, D.S., Warren, F.J., Lacroix, J. and Bush, E. (eds.) *From Impacts to Adaptation: Canada in a*

*Changing Climate 2007* Ottawa: Government of Canada, pp. 275-328.

Smit, B. and Pilifosova, O. (2001) Adaptation to climate change in the context of sustainable development and equity. In: McCarthy, J., Canziana, O.F., Leary, N.A., Dokken, D.J., and White, K.S. (eds.) *Climate change 2001: Impacts, Adaptation, Vulnerability. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press, pp. 876-912.

——, (2003) From adaptation to adaptive capacity and vulnerability reduction. In: Smith, J.B., Klein, R.J.T. and Huq, S. (eds.) *Climate Change, Adaptive Capacity and Development*. London: Imperial College Press, pp. 9-28.

Smit, B. and Wandel, J. (2006) Adaptation, adaptive capacity and vulnerability. *Global Environmental Change*, 16(3): 282–292.

Solomon, S., Qin, D., Manning, M., Chen, Z., Marquis, M., Averyt, K.B., Tignor, M. and Miller, H.L. (eds.) (2007) *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.* Cambridge: Cambridge University Press.

Turner, B., Kasperson, R. E., Matson, P. A., McCarthy, J., Corell, R., Christensen, L., Eckley, N., Kasperson, J. X., Luers, A., Martello, M. L., Polsky, C., Pulsipher, A., and Schiller, A. (2003) A framework for vulnerability analysis in sustainability science. *Proceedings of the National Academy of Sciences*, 100(14): 8074-8079.

Turner, N. and Clifton, H. (2009) "It's so different today": Climate change and indigenous lifeways in British Columbia, Canada. *Global Environmental Change*, 19(2): 180-190.

Wheaton, E. (1997) Forest ecosystems and climate. In Herrington, R., Johnson, B., and Hunter, F. (eds.) *Responding to global climate change in the Prairies: Volume III of the Canada Country Study: Climate Impacts and Adaptation*. Ottawa: Environment Canada.

Wheaton, E.E. and MacIver, D.C. (1999) A framework and key questions for adapting to climate variability and change. *Mitigation and Adaptation Strategies for Global Change*, 4(3-4): 215-225.

Yohe, G. and Tol, R.S.J. (2002) Indicators for social and economic coping capacity—moving toward a working definition of adaptive capacity. *Global Environmental Change*, 12(1): 25–40.