

**TOXIC TALK AT WALPOLE ISLAND FIRST NATION:
NARRATIVES OF POLLUTION, LOSS AND RESISTANCE**

BY

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DEDICATION

I dedicate this thesis to the memory of

Marjorie Williams

(Walpole Island)

and

Professor John Gehman

(University of Western Ontario)

and

my maternal grandparents, Victoria and Nicholas

from whom I inherited my love of learning.

ABSTRACT

This narrative ethnography is based on seven years of research collaboration with the Walpole Island First Nation (WIFN). The study focuses on local perceptions of risk as they relate to ecosystem integrity, human health and well-being. Discourse analysis of *generic* and *nuanced* community narratives reveals diverse yet complementary situated knowledges that are firmly rooted in Anishinaabeg (Ojibwe) cultural teachings, values and practices.

Gerald Ryle and Clifford Geertz's conceptualization of thin and thick description is used to parse out the various components of what I've identified as a community genre of *toxic talk*. Within this model, *thin description* refers to observations of the surface metamorphoses of the physical environment through pollution and other anthropogenic changes. *Thick description* emerging from the analysis of *elegies and echoes of loss* and *discourses of resistance* illuminates the discursive tactics employed by community members to resist Western frameworks of risk analysis and re-situate the topic of environmental health within the wider interpretive matrix of structural violence.

A proposed Shell refinery expansion project is used as an example of how WIFN actively mobilizes discourses via oral tradition in the struggle for environmental justice. Through the strategic use of toxic talk, the community draws attention to environmental issues while simultaneously laying bare to a wider, non-Native audience the historical scaffolding of Native issues that are part and parcel of contemporary environmental crises and their effective mediation and resolution. The 'discursive movement' from elegies and echoes of loss to discourses of resistance reframes Walpole Island residents from those who are defined by survivorship to those who embody and evoke a spirit of *survivance*.

The dissertation concludes with a semiotic critique of the Western medical terms *chemophobia* and *risk perception*. This leads to the advancement of toxic talk as an alternative framework for acquiring a more politicized, historicized and humanized understanding of environmental concerns at Walpole Island.

Keywords: Environmental health; Indigenous health; Walpole Island First Nation; risk analysis; risk perception; chemophobia; water quality; discourse analysis; grounded theory; medical anthropology; collaborative research anthropology.

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CHAPTER ONE

Introduction

Chapter Overview

This chapter serves as the introduction to the thesis and outlines the objectives and purpose of the project, which are framed and presented as four distinct research questions. By “putting the research into context,” I provide the rationale for choosing the topic of my dissertation. I employ the events surrounding the 2003 Royal Polymers Spill to illuminate the theoretical, methodological and ethical considerations that compelled me to pursue research on the topic of environmental risks at Walpole Island.

Objectives and Purpose of the Research

My primary objective in undertaking this research project was to explore perceptions of environmental health risks on the part of the Anishinaabeg (Ojibwe) living at the Walpole Island First Nation. Following Egan (1999:4), my goal was to gather data that represent a discourse that may be seen as an alternative to published biomedical and media accounts about contaminants and environmental concerns. My purpose was to highlight the voices of Walpole Island residents so that their concerns could be heard and understood by “outsiders” who are trying to communicate to community members about the risks of environmental contaminants in Lake St. Clair and the St. Clair River.

My engagement in long-term fieldwork in the Walpole Island community as a Doctoral researcher and consulting medical anthropologist on a multidisciplinary ecosystem health research team have brought into view contrasting discourses of pollution that fall within three different domains: the public media, the scientific

community and that of the Walpole Island community. I identify these domains as “interpretive communities” – Stanley Fish’s theoretical model for describing a cultural formation with a shared social and historical context that delimits the potential comprehension of a text (1976; 1980), or in the case of ethnographic research, discourse. Although the boundaries of interpretive communities can be somewhat fuzzy and overlapping, the fundamental premises of the construct are that members of various audiences have significant connections to their social locations or positions and use a broadly similar repertoire of interpretive strategies, which results in similar interpretations of risk communications (Hirschman 1998; Radway 1984). As Hirschman has noted, a condition of “bounded diversity” characterizes interpretive communities as actors construct individual meanings within the confines of an ideological structure (1998:303). In other words, membership in an interpretive community is characterized by *structured polysemy* that allows for a limited range of readings relevant to the cultural identifications and social positioning of actors (Hirschman 1998).

Comprehensive analysis of community narratives led me to recognize that true discourse analysis is not solely a linguistic enterprise dedicated exclusively to the strictly technical aspects of semantics and pragmatics but more importantly, that such a process entails a critical philosophical inquiry into divergent and often contesting epistemologies, values and worldviews. The vantage point obtained from situating myself at the nexus of different interpretive communities and the varying standpoints they encapsulate, embody and represent allowed me to discern and develop distinctive research objectives for my dissertation that I framed as four distinct questions:

1. Does every member of the Walpole Island community perceive environmental risks in the same way?
2. Do the Western medical terms “chemophobia” and “risk perception” accurately capture the experiences of WIFN residents living in a designated “Area of Concern” that poses daily threats to community ecosystems and human health?
3. Can narrative ethnography reveal new insights on Walpole Island community members’ conceptualizations of risk and their responses to ecological crises and environmental uncertainty?
4. How do divergent Western and Anishinaabeg values and worldviews challenge and/or hinder the effective cross-cultural communication of environmental risk across diverse interpretive communities?

These research questions were explored through semi-structured interviews, participatory observation and interaction with a diverse cross-section of residents conducted over the course of seven years of ethnographic fieldwork in the Walpole Island community.

I begin with an overview of the event that helped identify the research questions and served as my “entry point” for engaging in the study of environmental issues at Walpole Island. The Royal Polymers spill of 2003 schematizes an important baseline or frame of reference for understanding the purpose and objectives of this research project. Moreover, the context of the crisis foreshadows the methods and theories utilized for interpreting and understanding the research findings and indexes the evolution of the study from a focus on the thin description of surface phenomena, such as contaminants discourses and the communications of risk, to a more thick description of the complex

conceptual structures and deeply embedded meanings underpinning environmental health concerns and crisis events. I conclude with a summary of chapters that serve as a conceptual road map to the research process and its related trajectories.

Putting the Research Problem Into Context

At approximately 4:00 PM EST on Thursday August 14, 2003, problems with a power grid in the Northeastern United States instigated one of the most widespread power outages in North American history. The Northeast Blackout of 2003 left over 50 million residents without electricity for two days, contributed to at least 11 deaths and cost Canada and the U.S. an estimated 6 billion dollars (Global Security 2009; Minkel 2008).

The blackout posed serious risks to public health and safety (Bloch 2003; Deyo 2008; Geospatial Information and Technology Association 2009). Cessation of power to the cooling system of Royal Polymers Industries in Sarnia, Ontario led to the accidental discharge of 300 pounds of vinyl chloride into the St. Clair River.¹ The spill took place upstream from thirteen drinking water plants on both sides of the Canada-US border, precipitating a bi-national water crisis (Martz 2008). Fear turned to outrage when it was discovered that neither the Canadian government nor the public were informed until five days after the spill had taken place. Concerns over water contamination led to the issuance of region-wide public health notices. Lack of electricity, however, prevented

¹ There is debate over how many Royal Polymers spills actually occurred during the 2003 Blackout. Most sources mention one spill, however, others have referred to the occurrence of two spills. There is also inconsistency in reports of the actual amount of vinyl chloride that was spilled. Amounts cited in news reports range from 300 pounds to 700 pounds. Vinyl chloride is a health concern because it is a carcinogen that has been associated with liver cancer (Martz 2008).

citizens from following through on boil water advisories. In some regions, residents were directed to add bleach to the water as a “precautionary measure” (Tully 2005). Members of the public who recognized that adding bleach to their household water could kill bacteria but can in no way neutralize chemical contaminants were puzzled by the unclear messages being communicated via the media (Tully 2005). Questions surrounding the accuracy of the spill information and health advisories resulted in growing public skepticism and heightened levels of anxiety.²

Two localities directly affected by the Royal Polymers spill were the town of Wallaceburg, Ontario and the Walpole Island First Nation. Both communities are situated downstream from Sarnia and share the St. Clair River as their main water supply. During the summer of 2003, these communities formed the proverbial nexus of my universe as I conducted ethnographic fieldwork for my Master’s thesis at Walpole Island and resided a short 15-minute drive away in town. My presence in the region at the time of the spill allowed me to bear first-hand witness to the fear, stress and social upheaval that arose from this environmental crisis. For residents, the phrase “left in the dark” took on two meanings; the denotation of the power outage itself and connotation of the “masking” and purposeful obfuscation of knowledge by industry regarding the threat to human and ecosystem health posed by the accidental discharge of contaminants into the river.

² Of foremost concern were the potential adverse health effects associated with exposure to contaminated water. There were reports that residents from Stag Island downstream from Sarnia were suffering from nausea, disorientation and lethargy. It was also reported that twenty people living on the St. Clair River claimed to have become ill after swimming in the river during the days following the spill (Deyo 2008).

I had the opportunity to hear the experiences of several members of the Walpole Island community as they tried to cope with the crisis-at-hand. The Chief shared her experience of the communication breakdown that took place during the spill. She explained:

The first thing I heard was that someone had spotted raw sewage in the river. The phones were out so I got into my car and set out to find some answers. I couldn't get in contact with any government health official or representative to talk to on the Canadian side, so I drove over to Port Huron (US). It's then that I found out that there had been a chemical spill as well. We shut the island's water intake but that took some time to do. All the while, the chemicals were flowing through the river. It was hard to reach everyone in the community to tell them what to do and how to get bottled water. The community was in a state of panic and confusion. That spill taught us a hard lesson.

Meanwhile, a new mother with whom I spoke feared that the sudden rash that had erupted on her infant's body was the result of exposure to chemical-contaminated water:

I'd left my six-month old daughter with relatives. When I got back, I went to change her diaper and her bottom was so burnt, like rashy and blistering, unlike anything I'd seen before. Her stools were also an unusual colour and smell. I grilled my relatives to find out whether she'd been given anything out of the ordinary to eat or drink and found out that they'd mixed her formula with tap water while I have always only used bottled water. That's when I heard about the spill and that they were saying we shouldn't be drinking or using the water. But the notice came days later, so everyone kept on using the water. My daughter was very uncomfortable so I took her to the clinic and showed them her rash. I asked the nurse, "Could this be from the water?" She just laughed at me and walked away. I felt helpless and angry because nobody took my concern seriously.

At one point, I asked an elder from the community what she thought of the situation. She stated:

White people have a funny way of waging war. You see it in those old black and white movies, where one group would be hiding behind their castle walls, while their enemy would be trying to conquer them by starving them out or poisoning their wells. It's the oldest form of warfare, you know-chemical warfare. As Indian people, we live off the land and depend on the earth and her gifts for our livelihood and sustenance. Spiritually she is a part of us, as we are of her. Now earth, water and air are being destroyed - polluted, and we, as First Peoples are in danger. We are the most vulnerable. I guess they couldn't kill us off in the

residential schools and reserves they made so they're trying to get rid of us by polluting our water, fish and wildlife. In my mind, it's all the same thing. You know, it's all a form of cultural genocide. But chemicals don't recognize or discriminate based on colour, or race or class or borders. That's the funny thing and the sad thing, really, poisoned water poisons everything, and everyone...

The same question elicited a different, yet equally poignant response from the Director of the community's Cultural Heritage Centre, who observed:

We live on an island. Many times, our physical isolation gives us the illusion that we are distanced from the outside world, and on one level we are: our distinct culture and ecosystems are a testament to our uniqueness. Whenever there is a chemical spill, whenever there is a media report about the pollution of the St. Clair River, we are reminded of our vulnerability, of our health and of our way of life as a people. The waters that surround us are the source of our subsistence but are also our refuge. But they are also the source of our greatest concern. Culturally, we recognize and respect the importance of water. Environmental toxins have overshadowed the life giving power of water. We are fraught with fears of sickness and death that the polluted waters may cause.

The crisis had clearly hit a nerve. Interestingly however, the same event resonated with WIFN community members in very different ways. The discourses reflected diverse perspectives and experiences- stories rarely captured by media meta-analyses of the threat posed by environmental risks and the wide range of their effects.

The Royal Polymers spill was also the first time I heard reference being made to “chemophobia” – a biomedical term used as a shorthand to describe a fear of chemicals (US National Library of Medicine 2009). I soon became aware of a pattern of parallel discourses that were being disseminated by both the popular media and the scientific community. Environmental concerns vocalized by public citizens were labeled as chemophobia and eco-hysteria. Both terms denote “unjustified and irrational fears” and are often used disparagingly by environmental experts to dismiss public worries as uncritical, emotional, subjective responses stemming from lay peoples’ general lack of knowledge. The epidemiological dictum of “the dose makes the poison” together with industry rhetoric regarding unsubstantiated pseudoscientific claims of the negative effects

of chemicals on health and the environment were used to combat public critiques of industry practices and to dismiss public concerns as hyperbole and speculation.

I found the indiscriminate use of chemophobia and its various incarnations ethically disconcerting and epistemologically problematic. This compelled me to embark on future research on the terminology used to describe individual responses to environmental health threats. At issue was whether these terms were accurate cross-cultural “descriptors” of individual cognitive, affective and behavioural processes, or whether there was an alternative way of talking about peoples’ perceptions and understandings of risks; one that was more sensitive to the lived experiences of those directly affected by such threats, and that fostered a more nuanced, historicized and humanized understanding of the diverse political, social and cultural contexts within which these events unfold.

Representations of “community” in the aftermath of the spill were equally incongruous. Although each city centre and community had its own set of unique risks and hazards, the heterogeneity of the geographical and experiential “risk landscapes” was superimposed by a dominant discourse that constructed communities as homogenous, essentialized and reified entities facing the same threats, characterized by the same responses and adopting the same courses of action. Despite headlines that touted local media coverage of the “community experience”, the enplotment of the crisis was for the most part, devoid of details pertaining to local relevance or significance. The stories flowing from the pens and interpretive sieves of reporters, scientists and bureaucrats were not reflective of the “on-the-ground situation”, at least not the one to which I bore silent witness. It was a perfect example of what Charles Briggs (2007, 2008) calls the “biocommunicability” of information, the heavy mediatization of health events and the very politicized channels through which the flow of data is siphoned and distilled in the

process of knowledge production and discursive formation.³

There was a strong urban/rural dichotomy that was discernable in the news reports. Stories focused on major urban centres, with discursive themes ranging from serious concerns of civil disobedience to more lighthearted human interest stories of city dwellers enjoying the change of pace and freedom from technology and urban bustle brought about by the power outage. Community in this case, was confined to a very narrow description of urban reality. Very little media attention was focused on the experiences of small remote communities and the unique challenges they faced. It was assumed that the power outage and its after effects were collectively experienced in the same way by all. However, the concerns of those living in major city centres were very different from those voiced at Walpole Island, where residents were worried not only about the potential negative impacts the spill would have on human health, but its adverse effects on the island's rare wetlands, plant and animal species. The contrast between public media representations and the diverse private risk narratives emerging from different interpretive communities (and sub-communities) further fueled my interrogation of the uncritical use of "community" (with a capital "C") as a theoretical concept for denoting collective identity and as a 'cohesive' demographic and epidemiological unit for organizing and analyzing aggregate data.

Framed within the context of scientific and media narratives, the concepts of "chemophobia" and "community" share the characteristics of being essentializing, reifying, all-encompassing generic terms used in very indiscriminate ways to describe

³ The framework of "biocommunicability" explains how different parties imagine the production, circulation, and reception of knowledge and deconstructs the "mediatization" of biomedicine – how institutional practices are transformed to continually create biomedical objects for insertion into media coverage. It makes explicit the processes by which homogenized and reductionist meta-narratives of risk are funneled through scientific and bureaucratic structures to ascribe their own politically-informed packages of meanings on the perceptions and experiences of those occupying the lower echelons in systems of power (Briggs 2007, 2008).

communal risk attitudes and behaviours. They assume an intrinsic, monolithic and static state of being that is neither grounded in nor reflective of the range or continuum of lived realities that cross-cut geographical parameters, political boundaries, demographic and economic features, racial distinctions and lived experiences. This issue highlights one of the major problems with conventional risk nomenclature; its lack of specificity. Medical terms are devoid of context and fail to adequately index the historically constituted, politically shaped and culturally informed chain of events, situated knowledges and embodied experiences that were explicitly revealed to me by the Walpole Island residents with whom I'd spoken. From where I stood, physically situated and embedded within an ethnographic matrix of non-Western thoughts, actions and interpretive frameworks, the biomedical terms for risk represented indexical signposts that pointed to the many ways that conventional (etic) Western academic approaches fail to capture the all-necessary "emic" construction and conceptualization of risk.

The Royal Polymers example serves as a fitting prelude to the research proper for several reasons. First and foremost, it provides a context for the formulation of the research question. The spill paints a portrait of the events and processes that constitute a regional water crisis, as they appear and are initially understood "from the ground up". In so doing, the event lays bare some of the complex, multifactoral issues that challenge environmental health research among the general population, and Native communities in particular. Crisis situations reveal the fractures and fault lines of society (Herring 2009). In the case of the Royal Polymers spill, the event illuminates a range of dualisms in a number of contested spheres to bring into high relief the tensions and schisms between governing bodies and local citizens, the "core" and the "periphery", Native and non-Native political relations and the validity and authority of "expert" versus "lay" forms of knowledge.

The initial conversations that I had in the field the day of the spill set the tone for the narrative focus of the study methodology. As a research tool, discourse analysis is a method of inquiry that examines the structures of texts and considers both their linguistic and sociocultural dimension in order to determine how meaning is constructed (Barsky as cited in Makaryk 1993), thereby allowing one to scratch beneath the surface in order to view a more complex and dynamic set of phenomena. Far from being unidimensional, life events consist of multiple layers of histories, perspectives, experiences and understandings. For some WIFN residents, the water crisis of 2003 was understood as a consequence of modernization and an example of a lack of corporate and bureaucratic accountability. Some saw it as exemplifying the important role of communication in the production and dissemination of environmental knowledge (e.g. what kinds of knowledge are shared) and illuminating how health information and the construction of environmental risks can coalesce to form a site of consensus and cohesion, or a point of divergence and debate among various actors. To others, the spill was a more ominous sign of environmental racism, structural violence and even genocide. To this end, the case study “opens out” the possibility of studying alternative matrices for framing and analyzing risk perceptions and the dialogues that evoke historic crisis responses and provoke individual and collective acts of resistance to environmental threats. The capacity of local discourses, what Jean-Francois Lyotard (1979) refers to as “little narratives” or “local legitimacies”⁴ to reveal the tensions and contradictions between public meta-

⁴ Little narratives (*petit recits*) are forms of ‘customary’ or ‘local’ knowledge with the contextuality, provisionality and boundedness that this suggests (Geertz 1983). Little narratives do not depend on external, objective validation but are internal to the communities within which they occur. They determine their own criteria of competence and define what has the right to be said and done- that is, they are self-legitimizing. Unlike the scientific claims of grand narratives, which are couched in homological universals, little narratives are ‘paralogical’ which means that they accept what according to the canons of scientific logic would be called false reasoning and illogical arguments. Little narratives demonstrate a ‘sensitivity’ to difference and a willingness to tolerate the ‘incommensurable’ (Kumar 1995).

narratives of risk and to challenge hegemonic explanations of contemporary events formed the underlying theoretical rationale for deploying discourse as the primary medium or “vehicle” for studying risk perceptions at Walpole Island.

Equally important, the Royal Polymers spill represents an important epistemological starting point. The events of August 14th and the echoes of what transpired during the days, weeks and years that followed taught me that nothing is as it appears on the surface. A spill is never “just a spill”, especially at Walpole Island. Although the story of environmental pollution is viewed as a relatively new or recent phenomenon in the wider scope of Anishinaabeg history, it is part of a larger community history of contamination and struggle for environmental justice.

Decades of anthropogenic changes have threatened Bkejwanong lands and waters and have compromised both human and ecosystem health. Each ecological crisis leaves physical and emotional imprints that have become part of the community’s collective history and memory; this history and memory colour and inform residents’ interpretations of, and responses to, all other subsequent environmental health threats. In this sense, ecological events may be viewed as defining environmental epochs. Analogous to Michel Foucault’s articulation of discursive formations or *epistemes*, these environmental crises form the historical a priori that grounds knowledge and its discourses and thus represents the condition of their possibility within a particular time period. A series of environmental crises at Walpole Island have schematized a community-specific interpretive framework within which contemporary threats are framed, anatomized and understood. Being able to uncover the cognitive and experiential terrains that underpin the contoured landscapes of WIFN discourses that form the groundwork for WIFN epistemes of environmental knowledge requires a sensitive reading of the ethnographic context via the text obtained through the interview process.

Louis Althusser coined the term “symptomatic reading” to denote an interpretive strategy that searches not only for the structural dominants in a text but most importantly, for absences and omissions that are an indication of what the dominant ideology seeks to repress, contain or marginalize (1970: 28-9). Similarly, “reading against the grain” operates under the assumption that the text comprises a hierarchy of discourses in which one discourse – for example scientific ideology – asserts its dominance over others. Nevertheless, tensions between the dominant ideology and subordinate discourses produce ideological contradictions that can neither be easily masked nor reconciled. “Reading against the grain” seeks to explain the ethnographic subject’s relationship to social phenomena in a way that does not exclude or marginalize the study participant’s experiences. This knowledge necessitates rigorous textual analysis and keen attention to the detailed, microcosm of events that form the essence of ethnography.

The application of Gerald Ryle and Clifford Geertz’s notions of thin and thick description allowed me to see the structures underlying the ways people talked about, made sense of and exercised agency in the context of environmental crises. What emerged was another story, one that framed Indigenous environmental problems as nested within a larger embattled historical context of Native/non-Native political relations and cultural clashes. This tempestuous legacy is inextricably tied to broader issues of colonization, assimilation, historical trauma, nationhood and self-determination, Aboriginal rights, environmental regulatory practices, community economic development and cultural sustainability. The erosion of cultural knowledge and value systems and subsequent concerted efforts to revitalize and reinstitute ‘traditional’ environmental responsibilities and practices via the revitalization of the Ojibwe language and spirituality are integral pieces of the WIFN community’s environmental debate and struggle. The variable and divergent Anishinaabeg and Western interpretive matrices present an important entry point for deconstructing the contrasting knowledge systems that

instantiate incommensurable approaches to environmental philosophy and praxis.

A major hindrance to cross-cultural understandings of environmental issues is the Western world's Linnean propensity to pigeon-hole and treat as separate and unrelated human health and the health of other species (Darnell 2008). This goes directly against the Native view of "all my relations," which articulates and makes explicit the intimate connections between the human and non-human, animate and inanimate within the larger circle of life. Unfortunately, this cultural logic is marginalized to the hegemonic paradigms and narratives of Western science, industry and politics. Seminal research in oral history (e.g. Cruikshank 1990; 2005) has provided strong evidence for the value of oral traditions and the storied knowledges they preserve and disseminate for understanding the lived experiences of Indigenous peoples and how they come to understand and respond to changes brought about by society and nature itself. The goal of this thesis is to bring the focus back to the voices, knowledges and lived experiences of those most vulnerable to environmental health threats; those who face the full brunt of these crises and their serious aftereffects on a daily basis. My identification and articulation of a specific genre of community discourses that I have come to call "toxic talk" provides an intellectual sounding board for hearing the experiences of WIFN residents, and *listening* to their implicit messages of fear, pain, suffering and hope within an interpretive matrix of their own making. This is their story.

Outline of the Thesis Chapters

The remaining chapters of this thesis follow the path of the research process, beginning in Chapter Two where I provide a profile of the research site Walpole Island, its natural heritage features, history of ecological crises and contemporary environmental concerns.

In Chapter Three, I discuss how the research was actually conducted within the

ethnographic framework. To counter the monolithic and homogenizing representations of “community” and conceptualizations of “risk perception” (e.g. chemophobia) that permeate the psychological and biomedical literature, I draw on standpoint epistemology (Haraway 1988; Harding 1991, 1993, 1995) as my guiding conceptual lens for examining the diverse range of community environmental perspectives. The qualitative research method I used coalesced with a grounded theory (Glaser and Strauss 1967) perspective, which allowed me to engage in a collaborative and participatory relationship with participants from a diverse range of backgrounds. Applying a grounded theory approach also prevented the superimposition of Western epistemological structures or frameworks in the course of data collection and analysis that may not have been commensurable with Anishinaabeg ways of “knowing”, “being” and “doing” in the world.

The core thesis chapters are devoted to the voices of Walpole Island residents. I engage in two broad forms of meta-narrative analysis, “thin description” and “thick description” (the exact application of which shall be clarified in the methodology chapter). Through these analyses, I identify “toxic talk” as an alternative matrix for framing and understanding WIFN environmental discourses.

Chapter Four represents data accrued through “thin description”. In this thesis, thin description serves as a conceptual shorthand for the preliminary analysis of narratives regarding surface metamorphoses of the physical environment due to pollution and other forms of anthropogenic change. There are two categories of genres that constitute narratives of thin description. I identify *generic narratives* as those discourses that represent themes commonly shared by all of the participants interviewed. *Nuanced*

narratives refer to very detailed, context-specific information conveyed by six community subgroups: new and expectant mothers; Akii Kwe: The Women of Bkejwanong environmental Group; fishers and hunters; elders; Heritage Centre researchers and Health Centre frontline workers. The nuanced narratives reveal the specific concerns of these distinct WIFN “interpretive sub-communities”, their diverse experiential and ecological knowledges, the different proxies they utilize to gauge environmental change and the diverse strategies they adopt to respond to environmental threats. Dominant discursive themes address cumulative changes to Walpole Island ecosystems, animal and plant populations as a result of climate change, air and water pollution; changing land use patterns; invasive species; modernization and industrialization; changing patterns in traditional subsistence economies; the erosion of cultural values and the loss of Indigenous environmental knowledge (traditional ecological knowledges). Because the generic and nuanced narratives are intimately intermeshed and mutually reinforcing, they are woven together throughout the chapter. In essence, these discourses represent the warp and weft of complementary individual standpoints and collective values that merge and consolidate to bring into high relief the cultural fabric that forms the basis for WIFN’s environmental philosophy and praxis.

Chapter Five represents data accrued through “thick description” a form of ethnographic analysis that uncovers the superimposed multiple and complex conceptual structures that underlie human actions. I identify as a separate genre *elegies of loss* discursive formations that frame environmental change within a broader historical and political framework of *structural violence* (Farmer 1992, 1999; 2003; Farmer et al. 2006).

Explicit examples are drawn from narratives of loss of land, identity and culture shared by elders and residential school survivors. Resonances of elegies of loss are identified in successive generations as *echoes of loss*. Although representing a somewhat more ‘diluted form’ of structural violence (as the majority of those who express echoes of loss have rarely directly experienced historical forms of structural violence but have “made them their own” as they are passed down through generations through the oral tradition) these ripple effects of loss expressed by successive generations support the need for expanding biomedical terminology and environmental health paradigms so that they take into account changes to both physical and social environments, and the cumulative effects of these changes on the physical, emotional, mental and spiritual health and well-being of the WIFN population.

I present another form of narrative identified through thick description—that of *discourses of resistance*. Instances of resistance lay bare the culturally informed environmental narratives that coalesce to form the framework or matrix of WIFN’s interpretive community. I use the example of a relatively recent community response to a Shell refinery expansion to illustrate how the community mobilizes its own unique brand of “toxic talk” for a dual purpose: to address environmental concerns and social justice issues and also as a discursive device for opening out and making relevant to a larger, non-Native audience Native issues that are intimately interrelated with the mediation and resolution of ecological threats and their devastating manifestations as environmental crises.

Chapter Six presents an analysis and critique of conventional risk analysis studies through the semiotic deconstruction of chemophobia and risk perception. I further develop the concept of “toxic talk” and outline its utility as an alternative model for recognizing and understanding the kernels of insights and experiences that are distilled through the “thin and thick description” of WIFN environmental discourses; the content of these discourses and the contexts within which they are instantiated and interpellated are integral to understanding the ways in which WIFN actively mobilizes these narratives in the conjoined spheres of social and environmental justice. I present a detailed set of arguments for the advantages of adopting a toxic talk model for studying environmental health issues at Walpole Island. I conclude with an overview of related projects and future research directions that have been formulated to address both the epistemologically oriented questions of academe and the more pragmatic research needs and goals of the WIFN community.

CHAPTER TWO

Ethnographic Site

Chapter Overview

In this chapter, I introduce the ethnographic site, Walpole Island. I begin by describing the community's natural heritage and environmental research and activism. I go on to discuss the importance of natural resources to the Walpole Island economy. A brief synopsis of the community's environmental history reveals the legacy of impacts of chemicals spills on the St. Clair River (the community's main water supply) and Walpole Island ecosystems. Environmental health is discussed in the context of the health studies conducted in the community over the last four decades. I situate the WIFN environmental and health research within the broader context of environmental risk analysis, as practiced by Western scientists and medical doctors. Drawing on examples from Walpole Island, I discuss some of the logistical and cultural factors that challenge conventional Western approaches to the study of risk analysis. As part of my literature review, I define risk perception and provide a summary of seminal research on this subject in the fields of psychology, sociology and anthropology. This is followed by a critique of academic research on the study of risk. A succinct overview of the particular ways in which environmental pollution affects Indigenous communities provides a context for understanding the extent of the issue and its implications for Aboriginal populations.

Walpole Island First Nation

Walpole Island First Nation (WIFN) is located in southwestern Ontario at the head of Lake St. Clair, on the international boundary with the United States (Figure 2.1). Known as *Bkejwanong*, which means, "where the waters divide" in the Ojibwe language, WIFN

consists of six islands: Walpole, St. Anne, Potawatomi, Squirrel, Bassett and Seaway (Figure 2.2) that make up the present territory, which consists of a total area of 350 square kilometers forming the Canadian portion of a large river delta complex at the mouth of the St. Clair River (Nin Da Waab Jig & Chreod 1997: 2). Approximately 48% of the total area is marshland and constitutes the largest and most valuable wetland in the Great Lakes system. Bkejwanong territory also contains rare ecosystems that provide habitat for a diversity of endangered flora and fauna.

Walpole Island is the ancestral homeland of Ojibwe, Odawa (Ottawa) and Potawatomi peoples, who share a similar cultural heritage and cognate language (Nin Da Waab Jig 1987). Archaeological surveys have found evidence of Aboriginal occupation of the islands going back at least 3,000 years (Nin Da Waab Jig and Chreod 1997: 2). The Council of the Three Fires, a political and cultural compact modeled after the Three Fires Confederacy, was formed in 1940. Walpole Island is known for pioneering a community model for Aboriginal self-determination. In 1958, WIFN was the second band in Canada to assume responsibility of its own finances. Under the leadership of Chief Burton Jacobs, it was the first Native community in Canada to abolish its Indian Agent in 1965 and achieve a form of local self-government (Jacobs, 1995). Since then, the WIFN community has been self-administered under an elected chief and council. After the expulsion of the Indian Agent, the Band launched its first series of capacity building projects which included constructing a modern school, library and bridge; developing a police force; and improving agriculture (Jacobs 1995).



Figure 2.1 Walpole Island Regional Map

Source: Nin Da Waab Jig Walpole Island Heritage Centre



Figure 2.2 WIFN Island Map

Source: Nin Da Waab Jig Walpole Island Heritage Centre

In 1969, when a federal government white paper proposed to abolish Indian reserves and integrate Aboriginal peoples into the Canadian mainstream, Walpole Island was among the groups that organized and successfully fought this move (Jacobs, 1995). A few years later, when the Supreme court established that Aboriginal peoples had land rights, the community began to research its homeland to establish the basis of its claim (Jacobs, 1995). Due to the delay in this process, WIFN began an active campaign to protect its homeland, a movement that involved confronting a number of environmental issues (Jacobs 1995).

Although referred to as a “reserve”, Walpole Island has the distinction of being unceded territory because it has never been founded, legislated, established, set apart or surveyed as a reserve (Bkejwanong Natural Heritage 2009). Though the current territory is unceded land, the boundaries of the First Nation have never been formally defined. WIFN claims the whole of the Canadian portion of Lake St. Clair as well as lands beyond the present islands (Bkejwanong Natural Heritage 2009).

Walpole Island Natural Heritage

Bkejwanong territory includes 3,472 ha./58,000 acres, without prejudice to pending and future land claims. Approximately 43% of the community is categorized Class 1-3 agricultural land and 30% world class wetlands (Bkejwanong Natural Heritage 2009).

Walpole Island is world-renowned for its ecological diversity and consists of 30 sites of critical natural areas, including approximately 17,000 acres of world class wetlands and approximately 6,400 acres of Carolinian forests. The community also boasts rare oak-savannah sites and tallgrass prairie and scores of rare and endangered species. These

include: 5 plants found nowhere else in Canada, 58 species of butterflies (7 rare in Ontario), 138 species of birds (7 rare bird species), 108 provincially rare plants and 27 flora and fauna species on the Canadian Endangered Species List. Over 800 recorded species of vascular plants and 28 species of Reptiles and Amphibians (5 rare 28 species of mammals) have been documented, to date (Bkejwanong Natural Heritage 2009; Nin Da Waab Jig 2002, Nin Da Waab Jig et al. 2006).

Each year, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) reviews the national status of all recorded wild flora and fauna across Canada and assigns them to one of the following risk categories: extinct, extirpated, endangered, threatened, of special concern or not a risk. Plants and animals whose populations have declined across the nation are classified as “species at risk”. There are over 50 species at risk recorded on Walpole Island, including some that are not recorded elsewhere in Canada (Nin Da Waab Jig 2002:12). These species, which include mammals, birds, fish, reptiles, amphibians and insects have been identified through a life science survey, wildlife population surveys and other assessments conducted at WIFN over the past 15 years (Nin Da Waab Jig 2002:12).

Community Environmental Research and Activism

Through the Nin Da Waab Jig Heritage Centre (the research arm of the community), Walpole Island has actively engaged in a broad range of environmental research that draws on both western scientific and Indigenous traditional ecological knowledge as part of an ongoing commitment to ecological preservation and stewardship. Projects spearheaded by the Heritage Centre include: a life science inventory study that

documented and assessed terrestrial land features of the WIFN; an air monitoring study (1988-1995); an investigation of lead shot poisoning in local wildlife; experimentation with conventional tilling and low-tilling farming techniques; toxins study in collaboration with the Great Lakes Institute (University of Windsor); an aquatic communities study; various traditional ecological studies; fish habitat and freshwater mussel studies; a Habitat Stewardship Program (Species at Risk) and a census and draft Walpole Island Ecosystem Recovery Strategy.

Throughout its history, WIFN has resisted the intrusion into its affairs by Indian Agent and 'Headquarters', the Department of Indian Affairs in Ottawa, and non-Indian users of the marshlands. Since the 1870s, WIFN has actively protected its lands, marshes and natural resources through the negotiation of various leases, and assertion of rights and title to the waters and marshlands (McNab 1998). The community has taken pioneering steps in the area of environmental protection by engaging in abatement practices and advocacy work, including lobbying governments and working with Chemical Valley industries to reduce discharges. WIFN has been instrumental in intervening against several development applications by large corporations that would affect either the ecozone or the land claims of the First Nation (Jacobs 1996). A rotary kiln (incinerator) application by Laidlaw, a pipeline project (Interprovincial pipelines) crossing the bed of the St. Clair River and a proposed electrical bulk transmission line by Ontario Hydro were all subsequently denied or dropped by the respective corporations due to community protest and intervention (Jacobs 1996).

The community has gained national and international recognition for its leadership and innovation in the areas of environmental management, resource protection, sustainable development and environmental education (Bkejwanong 2005). In 1987, Walpole Island's prairies and oak savannahs were recognized as the most diverse remnants remaining in Canada by the World Wildlife Fund Canada. The community was awarded the "We the Peoples: 50 Communities Award" from the Friends of the United Nations in 1995 for its exemplary record in environmental research and sustainable development. In 2004, Carolinian Canada presented WIFN with a "Conservation Award" for its contribution towards protecting the natural diversity and habitats of Ontario's Carolinian Zone.

Ecosystem Health and the Walpole Island Economy

The livelihood of Walpole Island residents depends on the health of its ecosystems and integrity of its natural resources. Traditional economies continue to be an important source of subsistence and revenue for the community. WIFN citizens can still support their families through fishing, hunting, trapping and guiding activities. "Traditional economies" (fishing and duck hunting) have evolved into multi-million dollar modern-day industries that build on traditional ecological knowledge (Jacobs, 1986, 1988, 1996). Recreation and tourism are the community's number one industries, employing a large number of community members who work as hunting club employees and guides and in other businesses directly tied to hunting and fishing, such as oil and gas sales, groceries, suppliers and outfitters, restaurants, lodging, transportation, sales of native crafts, and the issuance of sports fishing licenses (Jacobs 1986, 1988, 1996). Natural resources are not

only important for WIFN's economy, but they also help to sustain cultural traditions and continuity and promote social cohesion (Jacobs 1996). The second leading WIFN industry is agriculture. In 1971, the community-owned Tahgahoning Enterprise was established with 200 acres. Today, Tahgahoning Inc. operates a 4,400 acre cash crop farm and dryer/storage facility (Jacobs, personal communication).

Walpole Island's close proximity to regions characterized by increasing urbanization, heavy industry, and intensive agriculture have threatened Bkejwanong's ecosystems, wildlife, and community health and well being. WIFN has faced a long succession of environmental crises; the community has had to devote considerable time and resources to counter threats to its environment from nearby industry and in some cases, municipalities, as it struggles to maintain its cultural heritage and its 'traditional' way of life (Nin Da Waab Jig and Chreod 1997: 2).

Environmental History

The traditional territory of Walpole Island is situated in a region with a long industrial history. Canada's oil industry began in Lambton County in and around the nearby towns of Oil Springs and Petrolia, areas that were rich in oil seeps and asphalt beds. By 1863, Petrolia was the major supplier of crude petroleum products in Canada (Petroleum History Society 2005).

The establishment of synthetic rubber manufacturing plants in Sarnia during the Second World War bolstered the city's status as a major petrochemical industrial centre. With approximately 450 petrochemical facilities, Sarnia has been dubbed the "chemical capital of Canada", producing more than forty percent of Canadian bulk chemicals,

mainly through branch subsidiaries of U.S. corporations (Petroleum History Society 2005).

WIFN is located downstream from Sarnia's "chemical valley" and downwind from the industrial core of the American mid-west. Over several decades, chemical plants and industrial waste sites in the region have released large quantities of chemicals and effluent into local waterways as a result of accidental spills and allowable discharges (Van Wynsberghe 2002). The "toxic" history of the region surrounding Walpole Island is so substantial, that it has led one expert to conclude that Walpole Island is the "guinea pig" of corporate environmental "progress" (Quinn 1991).

The St. Clair River

The St. Clair River is the community's main water supply and a significant source of subsistence, sports fishing and recreational activities. The 64-kilometer long river flows in a southerly direction, connecting Lake Huron in the north with Lake St. Clair in the south to form the international boundary between Canada and the United States (The Canadian Encyclopedia 2009).

Pollution has greatly diminished the water quality of Lake St. Clair and the St. Clair River. The establishment of petrochemical industries in the 1940s heralded in an era of dramatic environmental degradation. Given the lax environmental regulations of earlier generations, chemical valley industries were able to routinely discharge toxic chemicals into the St. Clair River throughout the 1950s and 1960s, virtually unchecked. Over those decades, the river became notoriously polluted (Nin Da Waab Jig and Chreod 1997:3). The problem was compounded by untreated municipal sewage and agricultural runoff; the

latter made worse by the increasing use of pesticides and fertilizers (Nin Da Waab Jig and Chreod 1997:3). As environmental controls tightened in the 1970s and measurement techniques became more sophisticated, it became evident that the river contained pollutant levels that were dangerous to public health (Nin Da Waab Jig and Chreod 1997:3). Spills traced to two of Dow Chemical's Sarnia chlor-alkali plants in the 1970s contributed to high levels of mercury in Lake St. Clair, which led to a decade long ban on Lake St. Clair fish and the closure of the Walpole Island commercial fishery (Marchand 1986). Although the closure of the fishery ended in 1980, there are still consumption advisories for large (predatory) fish.

Between 1974 and 1986, it is estimated that a total of thirty-two major spills as well as hundreds of minor ones, were responsible for the discharge of more than ten tons of pollutants into the St. Clair River (Jacobs 1988:4). In 1985, divers from the Great Lakes Institute discovered an oily sludge of chemical compounds that included dioxin. Traces of the compound, which infamously came to be known as "The Blob", were found in the drinking water of municipalities downstream and resulted in Sarnia's Dow Chemical being fined \$16,000 (The Canadian Encyclopedia 2009). Since 1986, the Ontario Ministry of the Environment has documented an average of 100 spills per year. A controversial controlled discharge in 1996 saw Imperial Chemical Industries (ICI) release 3.4 billion liters of industrial pond water into the river, despite vocal concerns by local residents over the possible toxicity of the treated water and its impact on the local environment. More recent spills continue to heighten public fears. A spill at Royal Polymers Ltd. on August 14, 2003 resulted in the discharge of over 300 pounds of St.

Clair River.⁵ Six months later on February 1, 2004, a leak in a heat exchanger at the Imperial Oil plant in Sarnia led to the discharge of 85,700 kg of the industrial solvents methyl ethyl ketone and methyl isobutyl ketone into the river⁶ (Ontario Ministry of the Environment 2005). Although the number of accidental spills is reportedly decreasing, Walpole Island residents remark that a reduction in spills from an average of three spills per week to one per week is evidence that industry can control spillage, but that it does not represent an improvement (Nin Da Waab Jig and Chreod 1997:3). The community's position has always been, and continues to be "zero discharge." Of equal concern are allowable discharges or so-called "legal spills". Canadian industries operating under certificates of approval issued by the Ontario Ministry of the Environment regularly discharge large quantities of toxic chemicals into Canadian waterways.

In addition to chemical spills and municipal sewage, pollution enters the river as agricultural run-off. Lake St. Clair is the tile bed for much of the farmlands of southwestern Ontario which allows agricultural pesticides to drain into the lake via the Thames Valley watershed (Assembly of First Nations 1995). The St. Clair River's use as a major shipping channel has led many residents to fear a Valdez-type disaster. High winds and the passage of commercial shipping vessels re-suspend chemical sediments that have settled at the bottom of the St. Clair River (Assembly of First Nations 1995). Lake St. Clair is relatively shallow and requires regular dredging of its seabed in order to

⁵ The Ontario Ministry of the Environment fined subsidiary Royal Polymers Ltd. CAN \$12.5 million (US\$10.4 million) for environmental violations related to the August 14, 2003 spill.

⁶ Imperial Oil Limited was fined \$300,000 CAN after pleading guilty to one count under the Fisheries Act in relation to the February 1, 2004 spill.

accommodate international shipping routes, posing another serious environmental hazard. Seaway Island is a man-made island composed of dredged material from the St. Clair River. Mercury-contaminated sediments have been stored in containments sites on the island; however, possible leakage from these sites and the potential effects on local wildlife continues to be a major concern for residents. Foreign vessels also carry another environmental threat. The dumping of ballast water by foreign ships is responsible for introducing the zebra mussel, an invasive species to Lake St. Clair and adjoining waterways.

In 1983, the Canadian-U.S. International Joint Commission (IJC)⁷, a bi-national regulatory body that monitors water pollution in the Great Lakes identified Lake St. Clair as an “Area of Concern”⁸. This designation is based on evidence of biological communities affected by sediment contamination and toxic substances in the water. Since the 1980s, governments including that of WIFN began serious efforts to understand and resolve a wide-range of environmental problems in the Lake St. Clair region. Most importantly, the petrochemical industry was forced to control its discharges more

⁷ Since 1972, the Canadian and the United States governments have been involved in the implementation of the Great Lakes Water Quality Agreement. This agreement is pursuant to the 1909 Boundary Water Treaty. This treaty provided a framework for subsequent cooperation between the United States and Canada on water (especially but not only in the Great Lakes). It created the International Joint Commission (IJC) and it includes the basic principle that the boundary waters and waters flowing across the boundary shall not be polluted on either side causing the injury of health or property on the other.

⁸ Forty-three Areas of Concern (AOCs) have been identified: 26 located entirely within the United States; 12 located wholly within Canada; and five that are shared by both countries. Two Canadian AOCs have been delisted and one U.S. AOC has been delisted leaving 30 AOCs remaining on the U.S. side of the border. Remedial Action Plans (RAPs) are being developed for each of these AOCs to address impairments to any one of 14 beneficial uses (e.g., restrictions on fish and wildlife consumption, dredging activities, or drinking water consumption) associated with these areas.

effectively and by the late 1980s, the situation shifted from one in which toxic chemicals routinely entered the river to one where the issue became accidental spills (Nin Da Waab Jig and Chreod 1997:3). This was still a matter of concern as major spills can have devastating effects, but it was a definite improvement. A system of warning notifying downstream communities (including WIFN) of the occurrence of a spill was established. Under this system, WIFN is able to close its water intake until the spill has passed. However, this method has proven to be inconvenient (and in some cases, unreliable) which has necessitated Walpole Island to invest in a community water storage tank (Nin Da Waab Jig and Chreod 1997:3).

Walpole Island residents harbour suspicion over the quality and safety of their drinking water. Many believe the community's food supply (local plant, fish and wildlife species) are seriously threatened by industrial pollution and are worried about its impact on the health of their children (Nin Da Waab Jig and Chreod 1997:3). Beach closures, water intake shut downs following chemical spills and the construction of a new water treatment plant attest to the scope and severity of water issues and also reflect community concerns over water quality and fears of toxic exposure.

Chemical Spills and Local Contaminant Loadings

The residents of Walpole Island are exposed to environmental contaminants in their food, drinking water and the atmosphere. There are a significant number of toxic contaminants in the St. Clair River (Table 1). Of particular concern are the local release of mercury, benzene and other aromatic hydrocarbons (ethylbenzene, diethyl benzene) or plastic monomers (styrene), and the more regional release of polyphenol benzenes (fire

retardants) (Bend et al. 2005:26). These compounds are not effectively soluble in the water or the air and are absorbed by plants and animals, including humans (Bend et al. 2005:26). Moreover, large amounts of persistent environmental contaminants, including hundreds of tons of mercury were released into the St. Clair River over several decades. In spite of the general “improvement” of the concentrations of mercury and persistent organic pollutants (POP) including PCBs, chlordane and DDE in the sediments of the St. Clair River, the scale of the contamination continues to be large (Thorburn et al. 2003, as cited in Bend et al. 2005:27).

Recent studies have indicated that there is high risk of exposure of WIFN residents to mobilized contaminants. A small sample of fish available for consumption by Walpole residents analyzed for mercury contamination revealed that fish from waters adjacent to Walpole Island (Lake St. Clair) contained mercury at concentrations of 10 to 50 times greater than fish that were imported onto the island (Haffner unpublished, as cited in Bend et al. 2005:28). These fish have levels 4-8 times greater than the levels of fish restrictions in the Guide to Eating Ontario Sport Fish (2005-2006); consumption of more than one meal of fish per week would place residents over the recommended mercury exposure limit. The Natural Defenses Resource Council places fish that fall within these levels of mercury on the “highest level of contamination-do not eat” category (Bend et al. 2005: 28-19).

Table 2.1 Selected chemical spills from industrial sites in the St. Clair River upstream of Walpole Island, March 1988-December 1990. Source: Dr. Judy Peters, from list of 1989 and 1990 spills into the St. Clair river, Great Lakes Spill Centre, Sarnia, Ontario (Bend et al. 2005:17).

Date of Spill	Type of Chemical	Quantity	Company
3/22/1988	Sodium Hydroxide	13 000 Kilograms	Dow Chemical
4/20/1988	Gasoline	14 000 Litres	Marathon
5/17/1988	Gasoline	450 Litres	Dow Chemical
5/19/1988	Caustic, Corrosive liquids	113 Litres	Dow Chemical
5/25/1988	Acrylonitrile	12 000 Kilograms	Polysar
5/27/1988	Sodium Hydroxide Solution	132 Kilograms	Dow Chemical
7/16/1988	Rain Runoff, Styrene, Benzene	970 000 Litres	Polysar
7/16/1988	Oily Water	523 000 Litres	Polysar
9/2/1988	Benzene	90 Litres	Polysar
1/11/1989	Propylene Oxide	6 266 Kilograms	Dow Chemical
2/8/1989	Phenolics & Benzene	10-15 Gallons	Polysar
5/17/1989	Hydrochloric Acid 37%	2000 Gallons	Dow Chemical
5/18/1989	Sodium Hydroxide 20%	38 Kilograms	Dow Chemical
5/31/1989	Toluene	11.7 Kilograms	Esso Chemical
6/5/1989	Hydrochloric Acid	34 Kilograms	Dow Chemical
6/5/1989	Hydrochloric Acid 4%	843 Kilograms	Dow Chemical
6/7/1989	Sodium Dichromate	24 Kilograms	Polysar
6/13/1989	Ethyl Chloride	8.1 Gallons	Ethyl
6/16/1989	Styrene	4 Litres	Polysar
6/19/1989	Aromatics, Styrene	35 Kilograms	Polysar
6/19/1989	Gas Oil	2 Gallons	Polysar
9/26/1989	Organic Phosphate	150 Kilograms	C.I.L.
9/28/1989	Benzene	4.5 Litres	Polysar
10/17/1989	Formaldehyde	10-25 Gallons	C.I.L.
10/17/1989	Diethylbenzene	93 Kilograms	Polysar
12/22/1989	Styrene	5860 Kilograms	Dow Chemical
13/30/1989	Sodium Hydroxide Solution	700 Kilograms	Dow Chemical
2/6/1990	Sodium Hydroxide	360 Kilograms	Dow Chemical
2/6/1990	Sodium Hydrochloride	7.8 Kilograms	Dow Chemical
2/23/1990	Carbon Tetrachloride	Unknown	Dow Chemical
10/30/1990	Ethyl Benzene	3600 Kilograms	Dow Chemical
11/6/1990	Ethylbenzene Mixture	182 Kilograms	Dow Chemical
11/8/1990	Polyether Polol (Voronol)	30 Kilograms	Dow Chemical
12/8/1990	Ethylene Dichloride	35 Kilograms	Dow Chemical

An Overview of WIFN Community Environmental Health Studies

Walpole Island's location within an area of high risk to toxic exposure has prompted the need for environmental health data. Several community studies have been initiated over the past decades for the purpose of collecting scientific evidence to investigate the potential links between environmental pollution and human health outcomes.

Mercury testing

Widespread mercury poisoning among residents of the Grassy Narrows and White Dog Reserves during the 1970s brought the problem of environmental pollution and its effects on Aboriginal populations to the forefront. Like other Native communities during this time period, blood and hair samples from Walpole Island residents were collected and tested for the presence of mercury. Background mercury levels for Canadians during the 1960s averaged between 1.5 and 3 parts per million (Jervis et al. 1970:34), while mercury concentrations in three 1970 hair samples from Walpole Island had 4.36, 9.14 and 49.9 parts per million. The highest value is comparable to the concentrations in maternal hair associated with children with congenital Minamata disease⁹ (Akagi et al 1998). Despite these findings, government reports at the time determined that the WIFN results fell within the 'normal range'. A forensic audit of the Great Lakes region conducted by

⁹ In Japan, people were poisoned by eating fish from Minamata Bay (hence the term "*Minamata Disease*") that had been contaminated by methylmercury discharged as a byproduct of the acetaldehyde process of the Chisso Chemical Company. Methylmercury penetrates the placental barrier, which may lead to accumulation in fetus resulting in neurological disorders (Irukayama 1966). It exerts its toxic effects on the central nervous system. Common symptoms of *Minamata Disease* include muscular tremors, sensory impairment, lack of coordination and emotional disturbance. Continual exposure to mercury affects the highest levels of the brain, resulting in loss of eyesight, hearing and speech, and a progressive deterioration of the intellect.

Michael Gilbertson (2007; see also Gilbertson 2004) using cerebral palsy as a health end point identifies potential outbreaks of congenital Minamata disease in Areas of Concern in the Great Lakes region. This study has renewed calls for a more comprehensive study of historic mercury contamination in Sarnia and surrounding regions.

Effects on Aboriginal Populations from the Great Lakes Environment Study

Between 1990 and 1999, Walpole Island participated in the Effects on Aboriginals from the Great Lakes Environment (E.A.G.L.E) Study, a joint project between the Assembly of First Nations (AFN), Health Canada and First Nations communities that analyzed the health and the environments of First Nations communities in the Canadian Great Lakes basin. The study adopted a broad view of health, examining the effects of pollution on traditional way of life and resulting socio-cultural well-being, as well as physical health (E.A.G.L.E. 1995). The E.A.G.L.E. study was composed of five components: *the freshwater fish and wild game program* looked at levels of contaminants in fish and game; *the eating patterns survey* collected data on community consumption of fish and wild game; *the contaminants in human tissues program* analyzed samples of First Nations blood and hair for chemical contaminants; *the health survey* assessed the health of First Nations communities and attempted to link this to environmental quality; and *the socio-cultural program* developed methods for understanding how environmental changes have affected the way of life in First Nations communities (E.A.G.L.E. Project Community Report 2000).

Blood samples from 41 WIFN residents (15 females and 26 males) were tested for contaminants and revealed that all of the results were below the Ontario Ministry

guidelines for lead in blood (readings less than 10 micrograms/dL are considered to be within “normal range”). Traces of PCB, Mirex, Methoxychlor, Hexachlorobenzene and DDT were detected in all samples. The study recommended further analysis to examine the spatial patterns of contaminants that were above the detection limits to determine if this information might provide assistance in trend monitoring and source tracking (E.A.G.L.E. Project Community Report 2000).

Walpole Island First Nation-University of Western Ontario Collaborative Studies

In 2004, the Walpole Island Heritage Centre in cooperation with the Walpole Island Health Centre forged a research partnership with a multidisciplinary ecosystem health research team from the University of Western Ontario’s Schulich School of Medicine and Dentistry. The first collaborative project was the Health Canada financed¹⁰ 2004-05 *Walpole Island Epidemiology Feasibility Study* (Bend *et al.*, 2005). Among the study’s major findings was that ecological degradation and the threat of human exposure to industrial contaminants were all major concerns for the WIFN community, and that residents exhibited a strong desire and willingness to participate in future research to investigate the health effects of exposure to environmental contaminants.

A *Mercury Exposure Through Fish Consumption Study* conducted in 2005-06 revealed that (12%) of the WIFN study group had an estimated mercury intake greater

¹⁰ Health Canada’s National First Nations Environmental Contaminants Program (NFNECP) was launched in 1999 as a collaborative research program between the Assembly of First Nations (AFN) and Environmental Research Division of the First Nations and Inuit Health Branch, Health Canada. The objective of the NFNECP is to help First Nations assess the extent of environmental contamination exposure and the potential for associated risk to the health and well being of First Nations in Canada (Health Canada 2009).

than the provisional tolerable weekly intake (PTWI) of 1.6 µg/kg/bw per week.

Exceeding these limits is of considerable concern for females of reproductive age because the FAO/WHO¹¹ guidelines are based on potential damage to the developing fetus (Bend et al. 2006; JECFA 2000, 2004). The fact that 72% of the WIFN community members who participated in the fish consumption study did not consume fish at all during the 3-month survey period sparked interest in pursuing further research on whether this projection was due to methodological issues inherent to the study itself¹² or whether these patterns truly reflect a decrease in fish consumption, in which case a study of potential factors for this trend (such as transition to Western foods and deviation from the traditional diet and/or food avoidance due to fears of contamination) would be pursued.

In 2008-2009, a *Baseline Biomonitoring Study* was initiated to determine the baseline level of mercury and other toxic metals (including arsenic, cadmium and lead) in hair and whole blood and persistent organic pollutants (POPs) in plasma lipids from 56 WIFN volunteers to help characterize their exposure level to these chemicals (Bend et al. 2009; Hill 2009; Schoeman 2009). Seventy percent (70%) of WIFN volunteers had mercury concentrations within the established reference range but 30% were higher, which suggests the need for WIFN-specific fish consumption guidelines, especially for women of child-bearing age (Bend et al. 2009; Schoeman 2009). Results showed that

¹¹ The Joint FAO/WHO Expert Committee on Food Additives (JECFA) is an international scientific expert committee that is administered jointly by the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO) that evaluates the safety of food additives. Its work also includes the evaluation of contaminants, naturally occurring toxicants and residues of veterinary drugs in food (World Health Organization 2009).

¹² Due to funding contingencies, the fish consumption survey was administered during a time period that fell outside the community's "peak consumption" season. Thus the findings must be interpreted cautiously.

several of the geometric mean concentrations of POPs¹³ were slightly higher in the WIFN population than in the comparative NHANES surveys¹⁴ including those for oxychlordane (1.8- fold), PCB 153 (1.8-fold), PCB 180 (1.9-fold) and PCB 138 (1.6-fold) (Bend et al. 2009; Hill 2009).

Tests were also conducted to examine whether a relationship existed between the incidence of diabetes in WIFN volunteers and the concentrations of individual POPs in plasma lipids because the concentration of selected POPs has been reported to be higher in diabetics tested in other studies (Lee et al., 2007, 2007b; Montgomery et al., 2008). The self-reported prevalence of diabetes within the WIFN community was 36%. There were no significant differences in plasma lipid concentrations between diabetics and non-diabetics, although there were positive trends for QCB and *p,p'*-DDE, and a negative trend for mirex and *cis*-nonachlor (Bend et al. 2009). A similar analysis was performed for PCB congeners in diabetic and non-diabetic volunteers. A significant difference was

¹³ The list of POPs included: organochlorine insecticides, tetra-, penta-, and hexachlorobenzene; α -, β -, and γ -hexachlorocyclohexane; oxychlordane, *trans*-chlordane, *cis*-chlordane, *trans*-nonachlor, *cis*-nonachlor; heptachlor epoxide; DDT and its metabolites, *p,p'*-DDE, *p,p'*-DDD and *p,p'*-DDT; mirex; photomirex; dieldrin (Bend et al. 2009; Hill 2009).

¹⁴ The National Health and Nutrition Examination Survey (NHANES) is a program of studies designed to assess the health and nutritional status of adults and children in the United States. The survey is unique in that it combines interviews and physical examinations. NHANES is a major program of the National Center for Health Statistics (NCHS), which is part of the Centers for Disease Control and Prevention (CDC) and has the responsibility for producing vital and health statistics for the Nation (Centers for Disease Control 2009).

observed only for PCB 177 and diabetes ($p < 0.01$)¹⁵ (Bend et al. 2009).

Data on the health status of volunteers and their families were collected through the administration of a Health Status Questionnaire that was adapted from the 2006 *Statistics Canada Aboriginal Children's Survey*. The health questionnaire provided detailed information about the disease burden in the community and sources of environmental contaminant exposure (Bend et al. 2009; Hill 2009; Shoeman 2009). Other integral components of this research study currently in progress include the digitization and analysis of health records of volunteers housed at the Walpole Island Health Centre and continued investigation of the psychosocial and cultural dimensions of environmental contamination in the Walpole Island community.

The Study of Environmental Risk Analysis

The environmental health studies conducted at Walpole Island conform to the research standards of the scientific interpretive community and the area of study known as *environmental risk analysis*, which estimates the likelihood of adverse health outcomes from exposure to an environmental hazard (US Federal Register 1986). Risk assessment is “an explicit, orderly and rigorous technique to deal with complex issues in determining whether a hazard exists and its potential adverse effects” (Shogren 1990:3). The analysis of environmental risks is separated into four main steps or categories: *risk assessment* the use of science and engineering to quantify the relationship between exposure, the

¹⁵ However, positive trends were also noted for total PCBs, PCB 99, PCB 118, PCB 153, PCB 138, and PCB 187 (Bend et al. 2009; Hill 2009). The remaining 36 plasma lipid samples for POPs will be analyzed as part of a follow-up study recently approved for funding by the Health Canada-National First Nations Environmental Contaminants Program to determine if there is a significant correlation between the concentration of organochlorine pesticides and PCB congeners and the incidence of diabetes amongst the WIFN volunteers with higher N values (Bend et al. 2009).

probability of exposure and the likely influence on public health and safety (in terms of morbidity and mortality); *risk perception* the examination of how an individual or society's subjective probability estimates and other psychological factors (e.g. dread, familiarity) influence choice under a risky situation; *risk valuation* the estimate of the economic value of a reduction in risk in order to determine the optimal level of risk and safety in society; and 4) *risk management* the attempt by the public and policy makers to regulate or control risk in the "best interest" of society (Shogren 1990:3). The following section provides a brief overview of risk assessment as it is presented in the scientific literature, and provides relevant information for situating the study of risk perception within the wider context of risk analysis.

Risk assessment is a fundamental part of biomedical and scientific studies of health threats posed by environmental contaminants. *Hazard identification*, an important component of risk assessment involves the collection, organization and evaluation of relevant biological and chemical information to determine whether a hazard may pose a risk to public health. Human clinical studies, interspecies comparison (toxicological methods) and epidemiological studies are used as a basis for the *estimation of the dose response function*, which quantifies how an individual's health responds to different levels of exposure. Another important step in quantitative risk assessment involves the identification of the population at risk and the likelihood of exposure to the hazard (Shogren 1990:4-5).

The magnitude, frequency, duration and routes of exposure are measured via an exposure estimate (US Federal Register 1986). This involves several steps. The collection of general information for each chemical hazard is followed by careful examination of the points where the hazard enters the environment. This data is used to determine exposure pathways and environmental fate (the multimedia transport or physical transformation of the hazard). Concentrations of the hazard are measured to provide input to estimate

exposure to all environmental media (Shogren 1990:4-6). The final stage of *exposure assessment* determines the exposed populations (human and nonhuman) in terms of size, characteristics, location and habitats. At this integrative stage of exposure analysis, the concentration estimates are combined with the descriptions of exposed populations to determine an exposure profile. The data summarized in the exposure profile includes information on the size of the exposed population, the routes of exposure and the duration, intensity and frequency of the exposure. An important component of the assessment includes identifying and making explicit uncertainties associated with procedures that may hinder or preclude the estimation of precise exposure distribution (Shogren 1990:7-12). The last step in environmental assessment involves the generation of a numerical estimate of risk that summarizes hazard identification, dose-response association and exposure assessment. Risk characterization determines risk thresholds, or “safe” exposure levels below which further analysis is generally not necessary (Shogren 1990:7-12).

Logistical and Cultural Factors that Challenge Risk Analysis

Quantifying environmental illness is primarily the domain of scientists and clinicians. In spite of the tomes of scientific studies conducted at Walpole Island, there has been an underlying dissatisfaction expressed by some WIFN community members regarding scientific studies on environmental health. This dissatisfaction arises from several factors, however cross-cultural miscommunication and other contingencies and setbacks arising from the ‘collision’ of the divergent conceptual matrices of different interpretive communities are often at the root of these conflicts.

One issue is the inaccessibility of biomedical data that is replete with technical jargon. Another point of contention is the issue of reference standards. The scientific

interpretive community uses reference standards such as “tolerable intakes” and other quantitatively-determined measures for safe thresholds of toxic exposure. These gauges are often not accepted by the WIFN interpretive community whose position is “zero discharge” of chemicals into the environment, and who do not consider any level of toxins as “safe”, especially if the standards are devised by industry and Western experts who seldom (if ever) consult with community leaders at the time these reference values are established.

Furthermore, scientific threshold values for chemical exposure are assessed for each chemical individually. The argument of WIFN residents is that Lake St. Clair and the St. Clair River are a “toxic soup” of chemicals. Therefore, threshold values designated on a “chemical-by-chemical basis” are irrelevant and rendered “meaningless” because they neither take into consideration the synergistic interactions that occur through the combination of different chemicals, nor do they account for the cumulative effects on humans or other organisms exposed to these contaminants over long periods of time.

Reference standards are often inapplicable because they are often based upon the behaviours of non-Aboriginal populations. For example, fish consumption guidelines do not take into consideration the higher consumption patterns of local fish and game by Native populations and their medicinal uses, nor do they consider possible differences in portion size or cuisine (e.g. the simultaneous consumption of different fish species) that fall outside the expected consumption practices used as benchmarks for provincial fish consumption standards. The fact that there are no federal guidelines for wild meat consumption speaks volumes to the fact that the very establishment of standards is based

on the needs of the dominant non-Native population. Because wild game is not a predominant food choice for the “Canadian population”, monitoring in this area has been neglected, to the detriment of Aboriginal populations.

Suspicion runs high of outsiders (e.g. academics and scientists) and their motives. Recent toxicological discourses have adopted the language of “cost benefit analysis” for assessing the advantages (e.g. omega three acid intake) and risks (mercury contamination) of consuming local fish. Attempts to disseminate information using this discursive dichotomy have been met with skepticism by some WIFN community members who view this as a form of “propaganda” and as a diversionary tactic of scientists whom they perceive as working in collusion with industry and the government to deny the controversial issue of contamination and to circumvent concerns about the safety of local food sources. The skepticism over scientific studies is often rooted in the double messages sent out by the research process itself, particularly in the sphere of risk perception research. On the one hand, researchers who engage in risk perception studies do so not only to identify perceived threats and population responses, but often to produce research that is of practical benefit to the study community, such as attenuating stress associated with ‘perceived threats’ from identified environmental health fears. Ironically however, the very presence of researchers in a community (whether they are taking blood and hair samples or conducting health surveys) is interpreted by the community-at-large as evidence of the existence of a serious problem, regardless of what the “official discourse” of the research team is regarding the purpose and objectives of the prospective research.

There are also cultural factors that problematize and limit participation in scientific studies. For example, the standards and discourses of the scientific community hold that taking hair samples is “less problematic” and “easier” than taking blood samples. This is based on the observation of the clinical behaviours of ‘Western society’ (e.g. non-Indigenous populations). For First Nations populations who suffer from high diabetes rates, blood glucose tests are a daily fact of life; blood extraction is not as much of an issue as is providing hair samples, because of the sacredness of hair (which is viewed as a living thing) and associated fears of it falling into the wrong hands and being used for malevolent purposes (e.g. sorcery, which is perceived as being able to inflict serious injury to the individual from whom the hair has been cut).

The emphasis on anonymity in conventional surveys is incommensurable with Indigenous standards for assessing knowledge where it is important to know the identity and expertise of an individual in order to assess the validity and reliability of the information that they’ve provided (Darnell and Stephens, n.d.). The separation of human health from the health of plant and animal species, the emphasis on individual health rather than community health and the use of the ‘nuclear family’ (rather than extended family modalities) as a standard unit of measurement instantiated through the standard discourses of health surveys are examples of Western conventions that do not conform to the value systems and social organization of the WIFN community (Darnell and Stephens, n.d.). In turn, these problems compromise the accuracy of community data accrued through the conventional paradigms and methods utilized in risk analysis.

The Study of Risk Perception

The study of risk perception analyzes human responses to risk associated with a natural disaster or environmental hazard. The widespread emergence of nuclear technologies in the mid-1960s brought with it the promise of a clean, renewable energy source. However, it was accompanied by public fear and skepticism regarding the potential short-term and long-term dangers associated with nuclear energy. The specter of nuclear accidents, such as the 1986 Chernobyl disaster led to a change in public perception and in more serious cases, a public backlash against this new technology (Giddens 1990). Both government and scientists were left wondering why public perception was so opposed to the use of nuclear energy when all of the scientific experts were declaring its high level of safety.

From the perspectives of many experts, the root of the problem lay in the difference between scientific facts and an exaggerated public perception of associated dangers (Douglas 1985). The chasm between perceived risks and actual risks, commonly referred to as the “perception gap” has been attributed to a number of variables, including a poor calibration between experts’ opinions and laypersons’ perceptions. These divergent and often contesting views have serious implications for regulatory practices and individual risk behaviour.

Risk perception as a formalized area of research grew out of the contesting beliefs of experts and lay people regarding the risks of various technologies and natural hazards. The scientific and medical literature identifies four main areas as central to the study of perceived risks: why some risks are more acceptable than others; lay persons’ perceptions of risky technologies and the determinants of their relative acceptability; factors that contribute to differences between layperson’s perceptions of risk from experts’ “objective” risk assessments; and information issues in risk perception and the subjective judgments of experts in risk assessment (Shogren 1990:13-14).

Originating with attempts to verify the von Neumann-Morgenstern (1944) axioms of expected utility theory, literature on the study of risk began to emerge in the post-war era. In a seminal article on risk acceptance, engineer Chauncer Starr (1969) argued that voluntary risk is more acceptable than involuntary risk. Any technology that inhibits public “voluntariness” was interpreted by Starr as being less acceptable to society. This early approach assumed that because individuals behave in a rational manner, individuals who experience exaggerated fears do so as a result of inadequate or incorrect information.¹⁶

Risk perception has become the subject of considerable research in the social sciences and to a lesser extent, the natural sciences (Mitchell 1984).¹⁷ Four major families of theory that have been developed to explain perceived risks include psychological, sociological, interdisciplinary and anthropological approaches.

Studies in Psychology

Early studies in psychology focused on how the processing of information informs risk perceptions and behaviours. Biases in comprehension were attributed to the categorization and simplification processes of human cognitive heuristics. Research conducted by Amos Tversky and Daniel Kahneman (1974) examining how subjects evaluated probabilities (in the context of gambling experiments) identified a number of heuristics¹⁸ that are used by individuals to evaluate information. They revealed

¹⁶ This early approach assumed that individuals behave in a rational manner, weighing information before making a decision. According to this model, the exaggerated fears individual experience are due to inadequate or incorrect information. This is based on the assumption that heightened fears can be attenuated through access to information that will help subjects understand true risk (Douglas 1985). However, numerous studies have rejected the belief that perceptions can be shifted through additional information alone. (Freudenberg 1993).

¹⁷ For a historical survey of risk perception research, see Otway and Thomas (1982), Slovic (1985, 2000) and Slovic et al. (1982, 1982b).

how the use of these short-cuts for thinking may lead to inaccurate judgments in some situations in which case, they become *cognitive biases*.

Building on this foundation, the *psychometric paradigm* identified a number of factors that contribute to risk perception. Research in this area focused on the roles of affect, emotion, and stigma in influencing the perception of risk. By examining expressed preference (how much risk people say they are willing to accept), Melissa Finucane and Paul Slovic were able to challenge Chauncer Starr's thesis by arguing that contrary to his assumption, people generally saw most risks in society as being unacceptably high, and that the gap between voluntary and involuntary risks was not nearly as great as Starr claimed (Finucane et al. 2000). In addition to showing that perceived risk is quantifiable and predictable, research in psychometrics revealed that risk perception is highly dependent on intuition, experiential thinking and emotions (Slovic 2000). This field of research identified a broad domain of characteristics that may be condensed into three high order factors: the degree to which a risk is understood; the degree to which it evokes a feeling of dread; and the number of people exposed to the risk (Slovic et al. 1982, 1982b). A dread risk elicits visceral feelings of terror, uncontrollable catastrophe and inequality. An unknown risk is new and unknown to science. The more a person dreads an activity, the higher its perceived risk and the more that person wants the risk reduced (Slovic et al. 1982, 1982b).

¹⁸ The *availability heuristic* described how events that can more easily brought to mind or imagined are judged to be more likely than events that cannot be easily imagined. The *anchoring heuristic* explained how people often start with one piece of known information and then adjust it to create an estimate of an unknown risk (with the adjustment usually not being big enough). They also identified asymmetries between risk seeking behaviour (with respect to gains and losses) and threshold effects in determinations of certainty. Another key finding was that the experts are not necessarily any better at estimating probabilities than lay people Slovic et al. (1982).

Notable studies that have drawn on social psychology frameworks for analyzing risk perception and behaviour include those of Michael Edelstein (1988)¹⁹, Janet Fitchen (1989)²⁰ and Dunn et al. (1994).²¹

Studies in Sociology

Popularized in the 1990s, the term *risk society* describes the manner in which modern society organizes in response to risk. The term's usage was closely related to the writings of sociologists Anthony Giddens and Ulrich Beck and was specifically linked to broader discourses and debates about modernity and growing public concerns about environmental issues. Giddens defines risk society as "a society increasingly preoccupied with the future (and also with safety), which generates the notion of risk" (Giddens 1999:3, see also 1999b). Meanwhile, Beck describes risk as "a systematic way of dealing with hazards and insecurities induced and introduced by modernization itself" (1992:21). Both authors argue that pre-modern society's perceptions of risk were largely based on threats produced by non-human forces. In contrast, modern societies, are exposed to risks produced by the modernization process itself, such as pollution, newly discovered

¹⁹ Michael Edelstein's study (1988) examines the response of Legler residents (a section of Jackson, New Jersey) to groundwater contamination and provides insights into the emotional stress of living near toxic waste sites. A newly revised and expanded edition of his book was published in 2003.

²⁰ Janet Fichten (1989) looks at the meaning of "home" to understand the emotional impact of groundwater contamination experienced by New York communities.

²¹ In 1985, it was discovered that people from Smithville, Ontario were exposed to PCB contamination through leakage to groundwater from a nearby PCB transfer station built in 1978. Dunn et al.'s study (1994) revealed the ensuing effects experienced by residents were actually due to psychosocial stress arising from the perceived risk of contamination. Tests conducted in 1992 showed that the chemical exposures were insufficient to cause physical health effects in the population.

illnesses and crime. Giddens differentiated between external risks and “manufactured risks”, the latter of which is distinguished by a high level of human agency involved in both producing and mitigating such risks (Giddens 1999). It is therefore possible for societies to assess the level of risk that is being produced because of the very fact that manufactured risks are the product of human activity. This process of reflexive introspection has the capacity of altering the planned activities themselves²². The focus on sustainability and decreasing levels of risk have emerged from reflexive modernization that has grown out of critiques of modern industrial practices.

The ways in which a risk society interacts with social hierarchies and class distinctions continues to be debated by sociologists (Caplan 2000). There is consensus that both the introduction of manufactured risks and reflexive modernization have altered the configuration and dynamics of social relations. Like wealth, risks are distributed unevenly in a population, which in turn differentially influences quality of life. Beck contends that older forms of class structure (based mainly on wealth accumulation) deteriorate in a modern risk society, where people occupy social risk positions that are achieved through risk aversion (Beck 1992). He has also argued that individuals who produce risk will more likely be exposed to their associated threats, creating a

²² For example, disasters such as Chernobyl and the Love Canal Crisis have led to increasing public distrust in industry, government and experts (Giddens 1990). In turn, social concerns have led to the increased regulation of the nuclear power industry thereby altering the course of modernization itself.

'boomerang effect'.²³ Giddens by contrast, has argued that older forms of class structure maintain a stronger role in a risk society (Giddens 1990). He is critical of those who adopt an uncritically negative attitude towards risk because he recognizes that active risk-taking is an essential element of a dynamic economic and an innovative society (Giddens 1999:29).

Interdisciplinary Approaches

The popularity of interdisciplinary approaches has infiltrated the study of risk. The Social Amplification of Risk Framework (SARF) combines research in psychology, sociology, anthropology, and communications theory. This risk analysis model outlines how communications of risk events is conveyed from sender to receiver. It is also used to explain the ways in which risks are amplified or attenuated through communicative action. Specifically, the theory attempts to illuminate the processes by which risks are amplified to receive public attention or attenuated to receive less public attention. The main thesis of SARF states that risk events conveyed through communication interact with a number of variables (e.g. individual psychological, social and other cultural factors) in ways that either increase or decrease public perceptions of risk (Kasperson et al. 1988). Through the use of the SARF model, researchers are able to examine the economic, social and cultural implications of risk perception, commonly referred to as the

²³ This argument suggests that wealthy individuals whose capital is largely responsible for creating pollution will also have to suffer when, for example, the contaminants seep into the water supply. However, this argument has been criticized as being overly simplistic, as those who have financial means have a greater ability to mitigate risk more easily (i.e. buying bottled water).

secondary or “ripple effects” of risk events that are not traditionally factored into risk analysis (Kasperson et al. 2005).

Studies in Anthropology

Anthropological studies have provided important insights into how different worldviews shape the risk perceptions of diverse populations. Mary Douglas’ *Purity and Danger* (1966) traced the words and meaning of dirt in different contexts in order to clarify the differences between the sacred, the clean and the unclean in different societies during different time periods. She challenged Western ideas of pollution via a complex, thorough and sophisticated reading of Leviticus in which she argued that Kosher laws were really about symbolic boundary-maintenance.²⁴

Douglas’ work was the conceptual basis for an emergent *Culture Theory of Risk*, which she elaborated in collaboration with Andrew Wildavsky in *Risk and Culture: An Essay on the Selection of Technical and Environmental Dangers* (1982). This theory represents an alternative to risk perception frameworks that are grounded in rational choice economics and the “weighing of costs and benefits.” The cultural theory of risk model illuminates how various structures of social organization endow individuals with perceptions that reinforce those very structures, in competition against alternative structures of organization (Douglas and Wildavsky 1982). The two founding premises of

²⁴ Douglas retracted her initial explanation in a reissuing of her book (2002) and instead proposes that “the dietary laws intricately model the body and the altar upon one another” as of land animals. In this context, Israelites were only allowed to eat animals that were also allowed to be sacrificed; those animals that depend on the herdsmen (Douglas 2002).

the theory are that the social function of individual perceptions of dangers tend to associate hazards with conduct that transgresses societal norms; and that cultural ways of life and affiliated outlooks can be characterized along two dimensions, “group” and “grid” which correspond to a specific social structure and particular outlook on risk (Douglas and Wildavsky 1982). Group refers to the degree to which individuals are bounded by feelings of belonging or solidarity. The greater the bonds, the less individual choice is subject to personal control (Thompson et al. 1990). Grid categorizes the degree to which people are constrained and circumscribed in their social role, the tighter binding of social constraints limits individual negotiation. Based on these observations Douglas and Wildavsky identify four ways of life: hierarchical, individualist, egalitarian, and fatalist. Each of these modalities is distinguished by either high or low levels of individual autonomy and collective control. A “high group” way of life exhibits a high degree of collective control, whereas a “low group” way of life exhibits a much lower degree of control and a resulting emphasis on individual self-sufficiency (Douglas and Wildavsky 1982). The authors assert that the struggle between adherents of competing ways of life associated with the group-grid scheme lies at the root of political conflict over environmental and technological risks. In recent years, risk perception expert Paul Slovic (1997; 2000) has attempted to devise a cultural cognition of risk that essentially merges the psychometric approach with more culturally-attuned models, such as those advanced by Douglas and Wildavsky.

The Problems Inherent In Risk Perception Research

By definition, risk “is the rhetorical vehicle health scientists use to project the past and present into the future” (Trostle 2005:151). At the same time, the concept of risk is “a particularly problematic medium for conveying scientific data because it has clear but divergent meanings to scientists and the general public” (Trostle 2005:152). As a social construct, risk is highly-politicized and frequently contested. Defining risk is an exercise of power, for “whoever controls the definition of risk controls the rational solution to the problem at hand” (Slovic 1997:95).

Brehmer (1987) has argued that it is impossible to perceive risk since there is nothing “out there” which can be called “risk” and which can be sensed. Hence, rejecting the very notion of risk perception. Risk and how it is conceived or perceived is rooted in the thoughts, beliefs and constructs of individuals (Sjöberg, 1979). As exemplified by the “perception gap” phenomenon, a person’s own estimate of risk may be very different from the “objective” estimate (see Boholm 1996). Ulleberg and Rundmo (1996) define “objective” risk as the risk that exists independent of an individual’s knowledge and worries of the source of the risk. Yet as Sjöberg (1995) has astutely noted, perceived risk is often a reflection of real risk, especially when the risk is well known.

The dominance of the psychometric paradigm in the field of risk perception has resulted in a proliferation of research that focuses on perception as mainly a cognitive process (Sjöberg 1996). According to this paradigm, risk can be understood as a function of general properties of the risk object (Sjöberg 1996). Objects are often marked by certain traits that people use as a gauge to rate them as risky or not risky. Fischhoff,

Slovic, Lichtenstein, Read and Combs (2000) have suggested nine general properties of activities or technologies central to the formation of subjective risk judgment.²⁵ People's risk judgments are a product of the degree to which these factors are related to potentially hazardous activities or technologies. However, this model is limiting because it fails to acknowledge variables that influence risk perception, but are beyond the properties of the risk object. For example, Sjöberg (1999) has identified a correlation between the level of perceived risk and the probability of harm or injury. Moreover, there was a perceivable association between the severity of potential consequences (should harm occur) and the demand for risk reduction.

Another important critique of cognitive approaches to subjective risk judgment is their tendency to decontextualize human risk experiences and responses. The "psychometric" approach in particular has been harshly criticized for naively attempting to "depoliticize" risk conflicts by attributing to cognitive influences beliefs that reflect cultural variation that manifest as individuals' commitments to competing cultural structures (Douglas and Wildavsky 1982). The fact that human beings do not live in a social vacuum has been used to advocate for approaches that have the capacity to frame and interpret risk perceptions within their social and cultural contexts (Boholm

²⁵ These are: voluntariness of risk; immediacy of effect; knowledge about the risk by the subject; knowledge about the risk in science; control over the risk; newness of the risk; chronic risk (one that may kill people one at a time) or catastrophic risk (one that can kill a large number of people at once); common risk (a risk one can think about calmly and reasonably) or dread risk (a gut reaction to risk), and severity of consequences.

1996;1998).

The cultural theory of risk has been presented as a model that is able to “predict and explain what kind of people will perceive which potential hazards as being dangerous” (Wildavsky and Dake (1990: 42). However as Boholm (1996) and others (Raynes 1992: 84; Sjöberg, 1997) have pointed out, there is very little empirical evidence to support the theory’s claims. Boholm (1996) has critiqued the culture theory model and has problematized many of its theoretical assumptions and methodological components. He notes that some of the conclusions related to typology predictions may be contained in the premises and, therefore, such predictions cannot be considered to be proper hypotheses (Boholm 1996) . Although culture theory does not directly refer to the use of “personality” as a guiding concept, it is related to personality by presupposing a correspondence between “way of life” and individual orientation. It also overestimates human agency in choosing their “ways of life” (Boholm 1996). As Bourdieu (1997) has pointed out, there is little evidence to support the idea that individuals deliberately select their institutional settings. Boholm attributes the paucity of supporting evidence to a lack of appropriate measurement instruments to measure the relevant aspects of culture. He also identifies the need to expand the framework so that it include other variables. Another problem is that cultural theory’s explanatory capacity may also be easily overestimated. The theory describes tendencies, dispositions and worldviews (Boholm 1996). Many researchers have observed that it is unlikely that cultural theory should be able to predict risk perceptions in specific situations. Further research needs to be conducted in order to test the theory across situations in order to see if any patterns or

tendencies reveal themselves. To determine whether worldview and culture can predict risk perception, one requires a systematic aggregation of risk situations. However, such large scale studies remain to be done (Boholm 1996).

The Value of Cultural Studies of Environmental Risks and their Effects

Despite the problems with some anthropological models of risk, it cannot be overstated that cultural factors play a significant role in determining what kinds of phenomena are considered to be high-risk or dangerous, how these risks are measured, and how group members are expected to behave in response to a perceived threat. Cultural understandings of environmental issues and how they relate to human health are in essence, constructions that can take on different meanings to different people, depending on the context of the discourse (Kaufert and O'Neil 1993, as cited in Egan 1999:23). Just as contaminants discourses are contextual and based upon the speaker's knowledge of or interest in the topic of discussion, constructions and perceptions of risk are socially-mediated (Kaufert and O'Neil 1993, as cited in Egan 1999). Risk perceptions are influenced by the accumulation and integration of personal experiences over a lifetime, as well as by interpersonal communication in a variety of domains and networks (Egan 1999).

There is wide variation in the impacts of perceived risk on different populations. Although there is a plethora of research on pollution in Aboriginal communities, both the scientific and biomedical interpretive communities often overlook the fact that the perceived risk of pollution is greatly amplified in Aboriginal communities where the effects of chemical contamination are more widespread and far-reaching. Mercury poisoning at Grassy Narrows and White Dog Reserves in the 1970s extended beyond

physical health problems. Suicides, child and wife abuse and alcoholism are just some of the problems that researchers have identified as the “ripple effects” of the community’s historic mercury crisis (Shkilnyk 1985; Kidd 1993; Vecsey 1997). Psychological studies focus only on the cognitive aspects and effects of perceived risks. In Aboriginal communities, perceptions of ecological changes and disruption of the special relationship that Aboriginal people have with the environment can have detrimental impacts on their social, cultural, spiritual and economic well-being. These qualitative impacts are not easily measured with standard social indicators (Wheatley 1996, 1997).

Activities such as hunting, fishing, and gathering native plants and food sources are important to strengthening and maintaining the social fabric among individuals, families and generations within a community (Van Oostdam et al. 2003). In a study by Kuhnlein et al. (2000), adult Inuit of the Canadian Arctic believe that harvesting and using traditional food provide a number of benefits, such as physical fitness, community well-being and the dissemination of cultural knowledge such as survival skills and lessons in food preparation (see also Kuhnlein 2004). Naomi Adelson (1998) captures the importance of living off the land and adhering to a “traditional lifestyle” through her articulation of the concept of “being alive well.” For the Cree of Great Whale River, this construct of health is defined through local beliefs, and practices, incorporating references to an idealized past, as well as contemporary ideals and practices of health that are tied to their identity as Cree. “Being alive well” means having access to and living in harmony with a larger environment that enables them to fulfill social, economic and spiritual needs. It draws upon cultural categories that are not tied to the biomedical construction of health and the absence of disease. The concept encompasses ideas and practices that transcend the individual body, comprising a whole way of life; past, present and future.

For example, food is a key element to “being alive well” but in turn, is based on the availability of land and animals. Furthermore, Cree food production and consumption are linked to the political and social realities of being Indigenous in Canada. The inability to “be alive well” does not necessarily indicate sickness *per se*, but indexes a less than ideal set of circumstances (Adelson 1998).

Food avoidance due to risk of contamination not only carries a dietary risk such as missing out on the beneficial nutritional elements of fish and wild game, but threatens the survival of traditional knowledge and life ways. Christine Egan (1999) contrasts scientific contamination discourses with those of Inuit women in Coral Harbor, Nunavut. She discovers that pollution is an overwhelming threat to cultural continuity and social cohesion. Prohibitions placed on the consumption of contaminated fish and wildlife jeopardize cultural identity, as being Inuit is linked to the procurement and consumption of traditional foods. Despite the direct health risks associated with consuming contaminated traditional food, there are potentially even greater risks stemming from the loss of this very important component of Aboriginal tradition. It is generally feared that radical dietary changes will result in the loss of traditions that have kept these communities cohesive and healthy (Egan 1999).

Anthropologists working on environmental health issues in Aboriginal communities have provided some of the strongest evidence and most persuasive arguments for the value of culturally-specific studies that examine the long-term effects of chemical exposure and how perceived risk are understood at the community level. It is in the spirit of this tradition of health research that I decided to explore environmental health issues at Walpole Island.

CHAPTER THREE

The Research Process

Chapter Overview

In this chapter, I describe the various components that make up the research process that informed this thesis project. I begin by discussing the basis for my research inquiry. This is followed by a synopsis of my relationship with the WIFN community, previous research that I conducted and a detailed description of the various aspects that were involved in preparing to conduct research at WIFN. The second half of this chapter is dedicated to an explanation of the theories and methods I deployed for this research. This section provides an overview of qualitative research methods and summarizes the four main theoretical orientations that were employed: grounded theory; standpoint epistemology and situated knowledge; dialogic anthropology and an emphasis on context. Beyond providing a 'laundry list' of academic approaches, I make the theories and methods relevant to the subject matter by explaining why I felt that they were appropriate for the research project and illuminating some of the qualities that these frameworks share with Anishinaabeg ways of thinking and doing. I conclude the chapter by discussing the merits of adopting a multiperspectival approach for this research project.

The Basis for My Research Enquiry

In addition to the observations made during the 2003 Royal Polymers spill, the idea to focus on community environmental discourses was informed by a number of converging factors. My M.A. research on residential school survivors highlighted the integral role of narratives and the sharing of traumatic experiences to both individual and community

healing. This research revealed a generic narrative of trauma that was consistent across different generations of students and schools attended (Stephens 2004; 2006).

I embarked on a serious study of environmental issues in 2004, with the examination of the WIFN community's health history during the period 1845-1885 as an independent project to fulfill a graduate course requirement in the Anthropology of Infectious Disease (2004b). The primary sources of evidence were the public reports and personal correspondences of the Reverend Andrew Jamieson.²⁶ Information from parish records and the reports of Indian agent contemporaries were also employed. Discursive analysis revealed how political and religious actors (e.g. Indian Agents and missionaries) used disease narratives to create a distinct rhetorical genre of risk that was deployed as justification for assimilation and proselytization (Stephens 2004b, 2007, 2008, 2009). I used a syndemics model²⁷ (Singer and Clair 2003) to show how the implementation of assimilation policies led to drastic changes in land use, resource access, subsistence economies and settlement patterns at Walpole Island in the nineteenth century. These transformations greatly reduced community members' self-sufficiency and precipitated periods of socioeconomic deprivation which in turn, both elevated the local population's risk of contracting airborne, waterborne and vector-borne diseases and compounded the

²⁶ Andrew Jamieson was a missionary who served as the Minister of Walpole Island's St. John Anglican Church St. from 1845-1885, respectively.

²⁷ Merrill Singer and Scott Clair (2003) have introduced the concept of *syndemics* as a way of expanding current understandings of new and emerging infectious diseases. Syndemics refer to "two or more epidemics (i.e., notable increases in the rate of specific diseases in a population) interacting synergistically and contributing, as a result of their interaction, to excess burden of disease in a population" (Homer and Milstein 2002). Syndemics also illuminate how social conditions such as poverty, malnutrition, poor housing, violence and lack of access to adequate medical care make a population more susceptible to new disease threats and less successful in fighting off existing infections.

severity of concurrent disease outbreaks (syndemics) (Stephens 2004b, 2007, 2008, 2009). Among other aspects of disease ecology, the archival documents provided clear evidence that water quality was a perennial problem for the community. As made explicit in his description of multiple outbreaks of waterborne diseases²⁸ in the community, Walpole Island Indian Agent Alexander McKelvey writes, “as a whole, these people are not healthy, and will never be healthy until more attention is paid to the quality of water they use” (Canada 1896).

The historical evidence, together with my training in medical anthropology, which ascribes to the dictum that poor health is more often than not the biological manifestation of structural inequalities (Farmer 1999; 2003), led me to extend the environmental history research into the contemporary time period in order to examine how the processes of modernization and industrialization, together with contemporary colonial policies and practices (e.g. Indian Act) and instances of environmental racism continue to compromise the health of Walpole Island residents. One WIFN community member’s prophetic statement that environmental toxins are the “smallpox blankets of the 21st century” (Stephens 2007) highlighted the fact that *processes and not pathogens* need to be the central focus of future environmental health investigations.

My foray into the exploration of contemporary environmental issues at Walpole Island was expanded when I took on the role of co-managing editor of a Species at Risk

²⁸ Common waterborne diseases at Walpole Island during the 19th century included: dysentery, cholera, non-specific conditions (e.g. diarrheal diseases) and hog cholera (affecting domestic livestock).

book that was translated into the Ojibwe language (Anishinaabemowin) by community elders (Nin Da Waab Jig et al. 2006). In 2004, the Director of the Heritage Centre asked me to assist him in preparing an application to the National First Nations Environmental Contaminants Program (NFNECP)²⁹ for the purpose of securing funding to study the potential negative health effects associated with living downstream from Sarnia's industrial complexes. The application was successful and the Heritage Centre³⁰ in cooperation with the community's Health Centre, contracted a group of specialists³¹ from the University of Western Ontario's Schulich School of Medicine and Dentistry to begin investigating the WIFN community's risk of exposure to environmental contaminants. I was invited to join the research team and assumed the role of consulting medical anthropologist.

Prior to conducting my ethnographic fieldwork, I took part in a feasibility study (Bend et al. 2005) conducted in the Walpole Island community that assessed whether there was enough scientific data and community interest to proceed with a full-scale environmental health study. My role in this study involved consulting with WIFN residents to assess their environmental concerns and to determine whether there was interest and willingness on the part of community members to participate in future

²⁹ The National First Nations Environmental Contaminants Program (NFNECP) was launched in 1999 as a collaborative research program between the Assembly of First Nations (AFN) and Environmental Research Division of the First Nations and Inuit Health Branch, Health Canada. The objective of the NFNECP is to help First Nations assess the extent of environmental contamination exposure and the potential for associated risk to the health and well being of First Nations in Canada.

³⁰ The Nin Da Waab Jig Heritage Centre is the research arm of the Walpole Island community.

³¹ The ecosystem health research team is an multidisciplinary group of clinical doctors, toxicologists, epidemiologists, statisticians and anthropologists with expertise in the area of environmental health.

epidemiological studies. A central component of this project was the examination of community perceptions of environmental risks.

One of my tasks involved constructing a short questionnaire based on my knowledge of local environmental concerns. The questions were refined as a result of input provided by community members, and the questionnaire ultimately became the foundation for the interview guide I used for my Ph.D. fieldwork. This interview guide would ultimately be expanded to include questions regarding sociocultural factors that were identified as areas of concern. In the course of this research, I became more aware of cultural teachings regarding Anishinaabeg environmental principles and practices and the importance of adopting a research model that is holistic and acknowledges the interconnectedness, interdependence and kinship ties of humans beings and the plants and animals that the Anishinaabeg refer to as “all my relations”. The dominant themes that emerged from these preliminary interviews revealed a high level of concern and stress resulting from local environmental crises. The study also revealed the existence of a wide range of “Indigenous Knowledges”, different sources of environmental threats and the perceived effects of chemicals on different types of local plants and wildlife.

In many ways, the feasibility study resembled an exploratory case study (Egan 1999; Yin 1989). The lessons learned from this work laid the theoretical and methodological foundations for my ethnographic research. Creating and administering the interview guide provided valuable hands-on experience in devising a culturally appropriate and community specific research tool. The interview process itself allowed me to learn culturally appropriate protocols for rules of engagement and also helped me to

hone interviewing techniques. Participant feedback provided insights on how to best utilize community communications media for announcing new research and disseminating research findings. Epistemologically, the interviews revealed the value and utility of discourses for investigating the social, cultural, and economic implications of environmental degradation and pollution in the community. Even more importantly, I recognized how fine-grained analysis and locally situated research brings into high relief the diversity of community environmental risk perceptions and concerns.

The major narrative themes emerging from the interviews provided a valuable overview of the nature, scope and severity of environmental issues at Walpole Island. The research revealed the varied and far-reaching effects of pollutants on human health. I recognized that the adverse effects of environmental contamination go beyond environmental illness and pathology and that assessing the social and cultural impacts of environmental threats is a fundamental component of health risk assessment and management.

The personalized stories and observations of cumulative environmental changes and embodied histories of environmental crisis and trauma further bolstered my confidence in the important information and rare insights that can be accrued through participant observations, open-ended interviews, collaborative research anthropology and narrative ethnography. I recognized that a research project focused on risk perceptions had the potential of making important contributions to the community. The Walpole Island Heritage Centre's mandate promotes community-driven research that can help to protect and preserve the island's biodiversity. Research on the WIFN community's

perceptions of environmental risk also had the potential to make an important academic contribution. There has been a great deal of attention on Indigenous environmental health issues in circumpolar regions, however very little research has been done in more 'Southern' Native communities. My research would be the first of its kind at Walpole Island and one of only a handful of studies that have been conducted in Southwestern Ontario.

While living in the WIFN community, I was given access to a rich resource of qualitative and quantitative environmental data housed at the Heritage Centre. The archival component of the research project allowed me to build on my existing knowledge of the community's health history. Having the Heritage Centre as my "home base" allowed me to acquire very specialized knowledge about local and regional environmental issues and concerns and tailor my research according to the community's research needs and objectives. I was able to tap into the wealth of information from the "living library" of WIFN researchers and residents. The feasibility study's broad sample population made visible the community's diversity. Although I had forged several friendships and working relationships with community members during my MA research, my work on the feasibility project and subsequent Species at Risk translation project significantly expanded my social networks. My extended presence in the community heightened my profile and informed community members of my intent to pursue a comprehensive future study of risk perceptions at Walpole Island. I took full advantage of my time in the community. I arranged formal and informal meetings with key community leaders and knowledge holders to obtain their wisdom and guidance on how to best

proceed with the prospective research. The extensive knowledge base I had cultivated through several years of research in the community, together with my growing passion for environmental research and social justice issues and love for the natural beauty of Walpole Island and its people informed my decision to pursue doctoral research in the community. I attribute the success of this project to the trust, rapport, reciprocity and mutual respect that grew out of these years of fieldwork and community collaboration.

Fieldwork Preparation

Prior to formally writing my research proposal, I discussed my research idea with Heritage Centre Director, Dave White and the then Chief of Walpole Island (and former Heritage Centre Director), Dr. Dean Jacobs, in order to ascertain whether the proposed project was an appropriate area of study. In adherence to the protocols of research ethics and the principles of “decolonizing” research among Native peoples (Smith 1999), I wanted to ensure that my research project was framed in a way that would address local research needs and maximize community benefits.

Walpole Island has a formal protocol for external proponents who wish to pursue research in the community. The Heritage Centre Committee consists of community members who review potential projects and assess whether they fulfill the community’s research mandate and objectives. Researchers request to attend the committee meeting to present their proposal, which is later discussed at great length. If the project is deemed appropriate, it is provisionally approved by the committee, which then forwards its recommendation to Chief and Band Council for final approval. I presented my proposal

to the Heritage Committee in February 2005 and received Band Council approval shortly thereafter.

After receiving committee approval for my Ph.D. proposal, it was necessary to obtain ethics approval from the McMaster University Ethics Board (MREB). An integral component of the McMaster ethics approval process includes familiarization with and abidance by the Tri-Council Policy for working with Aboriginal populations. As part of my ethics application, I developed two forms: one was a consent form for participants to complete before granting me an interview; the second was an explanation of the study itself (see Appendices A and B). The Interview Guide (Appendix C) was initially created from knowledge gained in my previous experiences of working with WIFN residents, as well as ideas gleaned from copious reading on topics regarding cultural constructions of risk. The guide was refined in the course of fieldwork through the invaluable feedback and insights gained from the men and women whom I had interviewed for the feasibility study, and the Heritage Centre researchers with whom I had collaborated on other projects. My research proposal was approved by the MREB on October 11, 2005 (Appendix D). Funding for this research project came from several sources.³²

³² This research was supported by a Social Sciences and Humanities Research Council of Canada (SSHRC) Doctoral fellowship; a SSHRC Queens Scholarship (2003-2004); a Mackenzie King Scholarship; a Richard Salisbury Award for research in applied anthropology; a McMaster doctoral fieldwork grant and a research stipend from the Indigenous Health Research and Development Program. Archival research was supported by a Philips grant for Native American research from American Philosophical Society and a James F. Harvey and Helen S. Harvey Travel scholarship (McMaster University).

Research Participants

I utilized various media to announce my research project in the community. I wrote articles that were published in the Nin Da Waab Jig Heritage Centre newsletter and Health Centre newsletter. I put out a general call for volunteers through posters and organized a mass mail out of flyers to WIFN households. I discussed the project as a frequent guest on the Heritage Centre's radio show, "*Aazhigan*." I made presentations at formal public events, such as the Heritage Centre's Annual Christmas Open House, Health Centre Christmas lunch (for the pre and post-natal program) and First Nations Library week. I was also invited to present to different departments, such as Children's Services, Social Services, the Health Centre and Retirement Home and groups, including the Residential School Survivors group, the Anishinaabemowin (Ojibwe) Language group, the Cancer Support group and Akii Kwe the WIFN women's environmental group. I displayed a poster and distributed information on the study at major events (e.g. the St. Anne's Island Treaty Celebrations, National Aboriginal Day Celebrations, Fall Family Fair and community pow-wows). I was able to speak to elders informally while volunteering for the Senior's Day luncheons and sessions of the pre and post-natal nutrition program. News of the project spread quickly by word of mouth through the growing circle of colleagues, friends and acquaintances I had formed through the years.

The study was open to male and female Walpole Island residents who were 18 years of age and older in order to capture the widest possible range of voices and perspectives. Interviewees came from a diverse pool of volunteers. There were people who were referred to me by the Chief, Heritage Centre Director, Heritage Centre

researchers, the Heritage and Health Committees and those who learned about the study through the print media and community presentations. Some individuals were referred by friends and relatives and recommended by members of special interest groups; others I met through volunteer work, work on other projects and social interactions.

I employed three sampling strategies commonly used in qualitative research: snowball sampling (chain sampling)³³, stratified purposive sampling³⁴ and opportunistic sampling³⁵. The goal was to interview a cross-section of the Walpole Island population that represented different demographic, social and economic positions. I strove to strike a balance between male and female, old and young, and those practicing “traditional” and modern subsistence strategies and heterodox healing and spiritual practices- although I recognize that dividing the world up in this simplistic way is problematic because rather than existing as rigid dichotomies, there is a continuum of practices in various spheres that change according to individual circumstances. The average age of participants was estimated as 47 years, however it was challenging to keep track of participant ages due to the vast numbers of informal conversations I had that did not constitute formal interviews, *per se*.

³³ In this method, participants or informants with whom contact has already been made use their social networks to refer the researcher to other people who could potentially participate in or contribute to the study. Snowball sampling is often used to find and recruit “hidden populations,” that is, groups not easily accessible to researchers through other sampling strategies.

³⁴ Stratified purposeful sampling illustrates characteristics of particular subgroups of interest and facilitates comparisons between the different groups.

³⁵ Opportunistic sampling involves following new leads during fieldwork, taking advantage of the unexpected flexibility.

In total, I conducted in-depth interviews with 60 individuals. Each participant was provided a study explanation sheet. The sheet provided information necessary for obtaining informed consent. Participants were also given a sample questionnaire a few days in advance of the interview, so that they could familiarize themselves with the kinds of questions they might be asked. This also gave them the opportunity to contact me with any questions or concerns.

Prior to the interview, participants were asked to sign a consent form. Verbal consent was accepted in lieu of written consent for those who requested it.³⁶ Volunteers were assured of their confidentiality and made aware that they would not be identified in the completed transcript. English is spoken by the majority of Walpole Island residents therefore the issue of language translation did not arise. However, I took a course in the Ojibwe language to familiarize myself with the ontological structures of this non-Indo-European language to put into context the narratives of fluent language speakers, which was pivotal to understanding the intimate and inextricable linkages between land, language and spirituality in the Anishinaabeg worldview (Darnell and Stephens 2007a, 2007b).

Research Schedule

I commenced formal ethnographic fieldwork in November of 2005 and was able to make frequent visits to the community over several years due to the close geographical proximity between my place of residence in London, Ontario and Walpole Island (a short

³⁶ This is a culturally appropriate practice especially among groups that rely heavily on oral tradition.

hour and a half drive away). Sometimes my visits were short; other times I stayed in the community for weeks at a time. The bulk of my formal interviews took place between April 2005 and December 2005. I lived in the community for that 9-month duration, which allowed me to schedule a number of formal interviews and also to become immersed in community life through involvement in a wide range of social and cultural activities. During my time in the Walpole Island community, I conducted in-depth interviews every day of the week and on weekends, either during the day or evening, whichever was most convenient for the participants. The majority of the formal interviews were conducted at the Heritage Centre, however I provided the option of conducting the interview in another location if the volunteer preferred. Thus on occasion, I had the opportunity to interview volunteers and their family members in informal settings, such as over a meal in the local restaurant or at their homes. Most of my early interviews were done individually. However, as word of the research spread and people with similar concerns came together, group interviews became commonplace. As is standard community protocol, volunteers were given an honorarium as compensation for their time and participation in the study. All of the sixty interviews were audio taped (using both a digital recorder and an analogue recorder as backup). I transcribed the taped interviews on an ongoing basis, while still in the field. I kept a journal where I logged fieldwork progress and recorded information collected through informal meetings and conversations.

Certain ethical and logistical considerations informed the way in which the data have been written up and presented in the thesis. In addition to fulfilling community

expectations of engaging in research that satisfies community goals and needs, researchers working at Walpole Island are expected to produce study documents that are easy to read and accessible to members of the WIFN population. Given this fact, I have made a concerted effort to limit the use of technical and academic jargon and to breakdown complex terminology and concepts into their constituent parts, so that they can be better understood by a broader audience. Given the small population of the community, I chose to withhold names and to add approximate ages (rather than exact ages) in order to maintain the confidentiality of study participants. Although, several of the fishers, hunters, plant gatherers and elders who were interviewed for this study are recognized as experts in their respective fields of knowledge and have participated in other traditional ecological studies conducted in the Walpole Island Community (see Lytwyn and Telford 2008), and so many of their stories and experiences have already become part of a larger collective narrative on contaminants and environmental change in the community.

Theories and Methods

Theory and method were intimately intertwined and mutually reinforcing in this research project. Care was taken to select conceptual frameworks and methodological approaches that were commensurable with Indigenous epistemologies and community research goals. My primary objective was to formulate a research model that was participatory, collaborative and that fostered symmetrical and co-equal relationships between researcher and community volunteers. A second goal was to challenge Western terminology and constructs that dominated the existing literature on environmental risk. My initial inquiry

into risk perception was stimulated by initiating a critique of the monolithic and essentializing constructions of knowledge and configurations of experience presupposed by the social construct of “community” and biomedical construct of “chemophobia”. I endeavoured to draw on approaches that would highlight heterogeneity and bring into full view the spectrum of community voices, perspectives, concerns and responses with respect to local environmental issues.

I was highly conscious of the political, ethical and epistemological problems inherent in utilizing conventional Western paradigms for framing and interpreting the social realities of Walpole Island residents. However, my standpoint and positioning as a non-Native researcher/outsider precluded me from drawing heavily on Anishinaabeg epistemological or phenomenological frameworks as I felt I lacked the depth of knowledge and the breadth of shared life experience to effectively or justifiably incorporate complex, culturally constituted paradigms into the research model. I also wanted to avoid as much as possible the error of researchers who use theoretical models in isolation to try to describe a “multidimensional world in unidimensional terms” (Nielson 1999). An emphasis on diversity and complexity was paramount throughout the research process. To achieve these goals, I employed four approaches as the primary modes of data collection and analysis. These are qualitative research, dialogism, grounded theory and standpoint epistemology (situated knowledge). Although it does not constitute an approach per se, context was recognized as an important variable within this interpretive matrix.

Qualitative Research Methodology

Qualitative research aims to develop a more widely contextualized understanding of a problem by developing objective knowledge about subjects' understandings (*emic view*) rather than focusing on statistically significant associations between researcher-defined variables (Connor et al. 2001:228). In ethnographic fieldwork, this unique perspective can be gained by placing the researcher in close association with the subjects through participant observation, participatory action, conversations and interviews (Connor et al. 2001). One of the advantages of qualitative research is freedom in schematizing the research design. Because there is no unified set of practices, a researcher can make use of selected elements that she/he deems most suitable for addressing a particular research question. Typically, there are three major components that define qualitative research: *data*, which are gathered from a variety of sources (interviews and observations being most common); *analytic procedures* that may include coding or diagramming of conceptual relationships; and *written and verbal reports of the research findings* (Strauss and Corbin 1990; 1994).

Interviews are foundational to social research and many anthropological treatises have been written on this research tool (Spradley 1979; Babbie 1990, 1992; Oppenheim 1992; Bernard 1994). The strength of qualitative research is its ability to provide complex textual descriptions of how people experience a given research issue. It provides information about the “human” side of an issue – that is composed of often contradictory behaviors, beliefs, opinions, emotions, and relationships of individuals. Qualitative methods are also effective in identifying intangible factors, such as social norms,

socioeconomic status, gender roles, ethnicity, and religion whose role in the research issue may not be readily apparent. It also fosters a richer and more complex understanding of specific social contexts or phenomena. Qualitative methods often engender a less formal relationship between the researcher and the participant and allow for greater spontaneity and adaptation of the interaction between researcher and informant. Participants have the opportunity to respond more elaborately and in greater detail than is typically the case with quantitative methods, while researchers are able to tailor subsequent questions to the information provided during the dynamic exchange of the interview (Holloway 1997). Following this tradition of naturalistic inquiry, I conducted interviews with community members in order to gain a more nuanced understanding of community risk perceptions, as they relate to the issues of environmental health threats such as water pollution, ecological degradation and environmental change through time.

Ethnography, Participant Observation and Participatory Action

Ethnography refers to the qualitative research method of describing human social phenomena based on data obtained primarily from long-term fieldwork. It is “the work of describing a culture”, the goal of which is “to understand another way of life” (Spradley 1979:3) or what Franz Boas termed the “native point of view” (see also Geertz 1983, 1983b). At the heart of ethnography is participant observation, an approach that distinguishes itself from natural science analytical methods on the basis of the intimate interaction between researcher and his/her “subject”. As Hortense Powdermaker

(1966:286) explains:

Essential to participant observation is the need for communication between the investigator and the people being studied, an important distinguishing point between the social and natural sciences. There is no reciprocal personal communication between the physicist and atoms, molecules, or electrons, nor does he become part of the situation studied.

Anthropologists have long been aware that it is impossible for the fieldworker to be a detached observer, “a fly on the wall” observing “the ethnographic other”. Instead the anthropologist is, in the act of observing, always a positioned subject in the field. As Johannes Fabian (1991) and Paul Stoller (1989) point out, if we are to reach an understanding of the lived experiences of our subjects, it is essential to participate actively in their lives, not only with our mind but with our body, emotions, senses and feelings. Participation in the field represents “a willingness to engage with another world, life and idea; an ability to use one’s experience, to try to grasp, or convey meanings that reside neither in words, ‘facts’, nor texts, but are evoked in the meeting of one experiencing subject with the other” (Wikan 1992: 463).

The degree to which anthropologists can access this particular perspective has been the source of much debate. As Clifford Geertz observes, “We cannot live other people’s lives and it is a piece of bad faith to try. We can but listen to what in words, in images, in actions they say about their lives” (Geertz 1986: 373). Hervik has called for a “shared reflexivity” in the field (Hervik 1994), one that allows the researcher to become engaged in the lives of participants, “sharing time and space with them, and finding common ways of coping.” Geertz’s elaboration of “thick description” (Geertz 1973), embodies the anthropologist’s commitment to understanding and absorbing the context of the situation

or behavior observed; ascribing present and future intentionality to that behavior and providing readers a sense of the emotions, thoughts and perceptions that the research participants experienced. In short, shared reflection provides a window to the manner in which other cultures classify their world, and the ways in which they endow it with meaning (Clammer 1984).

Because risk perception is a complex, multidimensional issue, it was necessary to adopt a holistic perspective for interpreting social and cultural phenomena. A comprehensive view of the community is a necessary feature of ethnography. Although my study is thematic in the sense that it focuses on a specific issue (environmental change), I encouraged participants to share not only their perceptions of environmental risks, but also their concerns about any other issues that they identified as “community problems.”

With each generation of social scientist, efforts have been made to systematize, formalize and improve upon the often enigmatic process of ethnographic practice (LeCompte and Schensul 1999). Margaret LeCompte and Jean Schensul have identified the hallmarks of successful ethnographic research. These include: commitment to producing a story of events as they occur in an natural setting; intimate involvement with members of the community or participants in the natural setting where they do research and a commitment to trust-building; mutuality that is built upon expectations of reciprocity, help, assistance and participation in the life of the community; commitment to the accurate reflections and perspectives of the participants in research; inductive, interactive and recursive processes of theory building to explain the behavior and beliefs

under study; inclusion of multiple lines of evidence (qualitative and quantitative data); examination of behaviour and belief in context and engagement in the analysis of cultural phenomena (1999:9-23).

There has been a steady movement toward social action in the social sciences. *Action Research*, also known as participatory action research (PAR), collaborative inquiry, emancipatory research, action learning, and contextual action research is founded on the core principle that research is “learning by doing.” Action research models aim to contribute both to the practical concerns of people in an immediate problematic situation and to further the goals of social science simultaneously, mainly through collaboration and co-learning. PAR was an integral part of my research model as my goal was to seek answers to questions that were both of academic and community relevance and concern.

Grounded Theory

Grounded theory (GT) is a systematic qualitative research methodology that focuses on social and psychological processes and the generation of theoretical concepts during the research process (Glaser and Strauss 1967). Developed in the 1960s by Barney Glaser and Aselm Strauss,³⁷ grounded theory approaches rely on the process of *constant comparative analysis*, in which data obtained through time are continuously and explicitly compared to detect themes and emerging meanings (Stommel and Wills 2004).

³⁷ Since their original publication “The Discovery of Grounded Theory: Strategies for Qualitative Research” (1967), Glaser and Strauss have disagreed on “how to do” GT, resulting in a split in the theory between Glaserian and Straussian paradigms. I have chosen to incorporate the Glaserian approach because of its broader definition of “data” and because Glaser’s approach is based on the original ideas from the 1967 and 1978 seminal works on grounded theory.

One goal of GT is to formulate hypotheses based on conceptual ideas. Another objective of grounded theory is to discover participants' main concern and how they continually try to resolve it. Preformed hypotheses are prohibited; the goal is to allow the data to yield insights in a series of increasingly abstract coding steps that allow for the emergence of concepts and theories to emerge. In most behavioral research, persons or patients are units of analysis, whereas in GT the unit of analysis is the incident³⁸ (Glaser and Strauss 1967).

For the purposes of this research, I followed the stages of Glaserian (classic) grounded theory. After collecting the data, I engaged in theoretical sampling, which involved conducting an initial analysis to determine where to go and what to look for next in data collection. Because analysis and data collection continually inform one another, I was able to use the *constant comparative method* to relate data to ideas, and ideas to other ideas. Next, I applied substantive codes to summarize empirical substance and themes that have relevance and fit³⁹. I used theoretical codes to conceptualize how the

³⁸ Validity in its traditional sense is consequently not an issue in GT, which instead is judged by fit, relevance, workability, and modifiability (Glaser and Strauss 1967, Glaser 1978, Glaser 1998). *Fit* describes how closely concepts fit with the incidents they are representing, which is related to how thoroughly the constant comparison of incidents to concepts was done. *Relevance* refers to studies that deal with the real concern of participants and are not exclusively of academic interest. *Workability* refers to the fact that theory works when it explains with much variation how the problem is being solved. *Modifiability* refers to a theory that has the capacity of being altered when new relevant data is compared to existing data. A GT approach is thus never right or wrong, it just has more or less fit, relevance, workability and modifiability.

³⁹ *Open coding* (the first level of coding) involves "coding anything and everything". Codes are applied, line-by-line to the narrative text that is examined. The codes serve as identifying anchors that allow the key points of the data to be gathered. Asking the question: "What is the data a study of?" leads to the discovery of the "*core variable*" – the focus of the research and theory which accounts for the most variation. *Selective coding* occurs when core variables and major dimensions and properties have been discovered, while *closed coding* involves limiting the coding to things related to the core variable.

substantive codes may relate to each other as hypotheses to be integrated into the theory. The true value of this process is that it moves the analysis beyond description, to the integration of concepts into an explanatory theory that interprets the nature of the research.

I adhered to the GT protocol for data analysis. I wrote in a stream of consciousness fashion and revised and modified my interpretations as more information became available. Because the GT approach discourages the superimposition of narrowly defined ideas or questions onto the research topic, I integrated relevant literature into the analysis *after* a clear and usable theoretical framework had emerged. The sorting of memos (analytical notes that form the building blocks of theory) led to the creation of an outline of the emergent theory that showed the relationships between concepts. I had a rough first draft of the write-up after the first round of data sorting. The final draft was structured around a core body of work that was clarified and enriched by the newly emergent theoretical insights. The dominant themes and subthemes that emerged during the course of discourse analysis are discussed at great length in the discussion section of the thesis.

“Being grounded” is an important value among the Anishinaabeg. People speak of the importance of family and community, of knowing one’s roots and one’s place, in order to keep them grounded, to remind them of who they are, where they come from and the values they hold as important. Traditional people speak of the need to walk barefoot, to make a direct connection with the ground in order to be able to reconnect with the energy of the earth. Grounded in this context denotes linking oneself up to the larger

circle of life and to a higher power, that of the Creator. There are other importance similarities or points of convergence between GT and Anishinaabeg ways of knowing and doing: these are the importance of embedding oneself in the social world, of taking things as they come and of 'being in the moment.' These values reflect the belief that things evolve in the Creator's time, that if something is meant to happen it will evolve or unfold in a certain way and at a certain time. The concept of "Indian time" has been misunderstood by non-Natives as a leisurely view of time, however it reflects a deeply rooted Indigenous understanding of the contingencies of life and the futility of planning. A great faith is placed in opening oneself up to all experiences and of making the most of teachable moments. The wisdom is "out there" in nature and the words of elders, but these can only be accessed if one opens his/her ears, mind and heart to listen. These Native values resonate with the principles of grounded theory on many levels. At another level, GT shares many of the characteristics of what Native scholars call a "decolonized methodology" (Smith 1999), for it allows theory to be built from the experiences of Indigenous peoples themselves within the context of their own life histories, values and knowledge systems.

Standpoint Epistemology and Situated Knowledge

Standpoint epistemology was developed by feminist intellectuals as a way of exploring the relative impacts of social constructions of gender on the production of knowledge. A standpoint is a place from which to view the world that determines what we focus on, as well as what is obscured from us. Societal inequalities generate distinctive accounts of nature and social relationships. Standpoint theory's central tenet is that the perspective of

the less powerful can provide a more objective view than that of the powerful. As Sandra Harding and Julia Wood (2006:491) explain:

Different locations within the social hierarchy affect what is seen. The standpoints of marginalized people provide less false views of the world than do the privileged perspectives of the powerful. Strong objectivity requires that scientific research start from the lives of women, the poor, gays and lesbians, and racial minorities.

This position grows out of the idea that individuals with subordinate status have greater motivation to understand the perspective of power groups and that they have little reason to defend the status quo.

The goal of *strong objectivity* is founded on the premise that objectivity (as it is conventionally conceptualized and exercised) is not rigorous or objectifying enough. The socially situated grounds and subjects of standpoint epistemologies require and generate stronger standards for objectivity than those that turn away from locating knowledge historically. Harding's main observations are that some objective social locations are better starting points for knowledge projects. Social situation both organizes and limits our ability to understand the world in societies stratified by politics that form the very structure of society. Hence, the activities of those occupying the higher echelons of power organize and limit their knowledge generating position (Harding 1991).

There is a distinct difference between the ways in which empiricism and standpoint epistemology frame and understand the world. Those who ascribe to a standpoint theory approach recognize that it is communities (and not individuals) that are the primary sites of knowledge production, given that a belief only gets transformed to

knowledge when it is socially legitimated (Harding 1991). Standpoint theory uses the social situatedness of knowledge claims as a resource for maximizing objectivity.

Donna Haraway's contribution to standpoint theory comes from her articulation of "situated knowledge" which she defines as "a doctrine of embodied objectivity that accommodates paradoxical and critical feminist science projects" (Haraway 1988). Her critique grew out of a critical examination of the rhetoric used in scientific discourse which presents science as an objective pursuit of the truth. Haraway instead suggests that science is a social construction, citing the historical use of "science" as justification for racist doctrines. The "gaze from nowhere" (Haraway 1998:1991) also referred to as "the God-trick" describes the process of "abstracting" the grounds for knowledge from history and social life, despite the fact that they are intimately entwined. Haraway identifies this as a "rhetorical move that hides and protects the interests of those who most benefit from it, typically white Western males" (Barnes 2000:742). In the critique of Western science and its claims of "value-free" research and "neutrality" the dictum of standpoint theorists is "not... the view from nowhere, but always the view from somewhere." (Barnes 2000:743). In this sense, situated knowledge challenges scientific constructions of objectivity because it emphasizes "embodied physicality, social construction, and cultural politics" rather than a "disembodied, inviolable and neutral" truth (Barnes 2000: 742).

Standpoint epistemology and situated knowledge are often criticized as discrediting the notion of reality and taking the position that because everything is subjective, it is meaningless. On the contrary, Haraway emphasizes that reality should not be simply thought of as an "act of faith" and should instead be something that can be

talked about. Equally important, attention should be given to the multiplicity of voices that exist. Pooling individual partial knowledges facilitates attainment of a sort of truth, a “solidarity of politics” (Haraway 1991), that is different from the singular, and in this case, unattainable, objective truth.

The two major contributions of standpoint theory are the observations that knowledge is conditioned by gender, race, class, social class, and that personal experiences all play a part in how one interprets the world; and that purely objective knowledge does not exist, only partial knowledge. This position facilitates a shift away from subjects examining objects, to subjects examining each other through two-way conversations that are “open-ended, varied, sometimes inconsistent and paradoxical” (Barnes 2000:743). It also opens the door for the acceptance of dialogism as a vital form of knowledge production.

I find the concepts of standpoint theory and situated knowledge to be valuable tools on account of their sensitive deconstruction of knowledge claims and power, but also because they are consistent with the Anishinaabeg view of the partiality and specificity of knowledge. This is common in Native societies where certain information or knowledge is the domain of different knowledge keepers. The type of knowledge held is determined by a variety of factors (gender, occupation, prognostication or prophecy). The Medicine Wheel, for instance, is an Indigenous heuristic device for framing and understanding complexity; at the level of the individual, it provides a more personal level of understanding one’s own role, purpose and life trajectory. But the Medicine Wheel also represents the interconnectedness, complementarity, relationality and

interdependence of all living things. This teaching is embedded in the story of the creation of the clan system. Knowing one's place, one's role and responsibilities and respecting those of others is a cultural manifestation that conforms to Anthony Wallace's model of the *organization of diversity* (1970). His idea is similar to Harding and Haraway's arguments for standpoint and situated knowledge. For Wallace, knowledge is socially and culturally situated; the aggregation of complementary partial knowledges is crucial for obtaining a holistic perspective and understanding of the world. This ethos is exemplified by the Anishinaabeg saying that "one must walk in one's moccasins" that is, have a sense of one's life context in order to understand that person's views and actions. This is also reflected in the Medicine Wheel teaching that one cannot attain individuation or self actualization unless they have walked around the entire circle of the Medicine Wheel to learn the spiritual and philosophical lessons associated with each different direction.

Dialogic Anthropology

The concept of dialogism was developed by Michael Bakhtin as part of his interpretation of medieval European carnival and subsequent articulation of the "carnavalesque" (Bakhtin 1981,1984; Holquist 1981). For Bakhtin, "life by its very nature is dialogic. To live means to participate in dialogue" (Lotman 1984:292-293). The significant units in culture are dialogic utterances in full context. From within these utterances, emerging subjects perform polyphonic, heteroglossic and double-voiced dynamic texts that cannot

be separated from ideological spheres, chronotopes or horizons.⁴⁰ Bakhtin's remarks are relevant to the fieldwork experience and the translation of ethnographic data because they capture the dilemma of the ethnologist whose perception of time-space (chronotopes) and world view (consciously or unconsciously) penetrate his/her view of the environment and permeates the dialogue between subject and investigator (Holquist 1981; 1990).

Inspired by Mikhail Bakhtin, the American ethnologists Dennis Tedlock and Bruce Mannheim, (1995:2) have advocated for a program of dialogic anthropology.⁴¹ The rationale for this research method stems from the authors' claim that "(e)ven as the voice of objectification or interpretation (researcher) narrows itself toward an authoritative monologue, a multiplicity of voices goes suppressed"⁴² (1995:2-3). Within the dialogic model, "the disciplinary voice of the ethnographer still has its place in a multivocal discourse," however it becomes provisional "leaving room for the reader's interpretation" (1995:3). The implications of a dialogical framework and anthropological interpretations of "culture" are significant. As the authors explain:

⁴⁰ Bakhtin's *chronotope* refers to perceptions of time and space affected by cultural traditions which underlie and shape specific texts. In discussing the horizon, Bakhtin notes, I see the world from a 'horizon,' the world gives itself as immediately around me, as circumscribed by the unique angle of my vision, as a surrounding full of specific meanings by my own ends" (Holquist 1981: 7). For a detailed explanation of chronotopes and horizons, see Holquist 1981, 1990.

⁴¹ Tedlock and Mannheim also credit Roman Jakobson, who saw dialogue as a more fundamental form of speech than monologue-calling the latter a form of social pathology (Jakobson 1953:13, as cited in Tedlock and Mannheim 1995: 1) with advancing the Bakhtinian dialogic.

⁴² According to Tedlock and Manheim, dialogue includes internal dialogues and "talking across or alternately", which is distinguished by the negotiation of comprehension out of difference. This is opposed to ideas of closeness or comprehension that earlier anthropological allusions to what may be termed a consensus model of "rapport" between fieldworker and subject suggest.

(O)nce culture is seen as arising from a dialogical ground then ethnography itself is revealed furthermore as an emergent culture (or intercultural) phenomenon, produced, reproduced, and revised in dialogues between field-workers and natives. This process of its production is of the same general kind as the process by which ethnic others produce the cultures that are the objects of ethnographic study (Tedlock and Mannheim 1995:1).

Narrative ethnography is a complementary theory that emphasizes ethnographic dialogue and builds on dialogism by developing a strategy for presenting and interpreting cross-cultural talk that incorporates methodological as well as modal strategies (Rios and Sands 2000). Barbara Tedlock notes that the dialogue between the collector and the narrator aims to “create a world of shared intersubjectivity and to reach an understanding of the differences between two worlds.” She further states that “in phenomenological terminology, this communicative interaction or ‘we talk’ belongs neither to the realm of objectivity nor to that of subjectivity but to human intersubjectivity” (1991:70-71). As words bridge the gulf between self and other, they reveal both parties as vulnerable, experiencing and working to co-produce knowledge (1991:80). In many ways, this research project is narrative ethnography in that it uses environmental discourse as a vehicle to explore the “betweenedness” (Tedlock and Mannheim 1995) of the culturally constructed worlds of Western science and Indigenous knowledge. The fault lines that divide the WIFN and scientific interpretive communities are made explicit through the meta-analysis of community risk narratives or “toxic talk” and critique and the deconstruction of standard concepts and terminology of risk analysis.

I chose dialogism as a research method because it embodies Anishinaabeg values pertaining to the primacy, significance and power of the oral tradition and the important place it occupies in Native culture. I was able to adhere to a dialogic framework by

incorporating several interview quotations into the thesis. This was done for two reasons: to allow the words to “remain as true as possible” to the original intent and tone of the speaker; and to provide enough contextual information so that the reader can derive their own interpretations and come to their own conclusions (apart from those rendered through the author’s analysis). The importance of reader interpretation is recognized by Anishinaabeg storytellers who maintain a certain amount of openness to their stories, invariably retaining some information while pointing out potential problems or solutions in the story, all for the purpose of engaging the listeners’ thoughts and imaginations so that they themselves can determine the parts of the story that are most relevant and significant to them. In many ways, Anishinaabeg storytelling, like dialogic and narrative anthropology is a collaborative, flexible, ever evolving process, committed to polyvocality, multiple standpoints and situated knowledges, all of which are central to my research project.

Emphasis on Context

All of the conceptual frameworks that I’ve chosen to be part of my “theoretical toolkit” share several things in common. The most obvious and pervading is the centrality and significance of context to the study of cultural constructions of risk. This point is crucial to the study of Native history and experiences and cannot be overemphasized.

Anthropological studies have always focused on the importance of cultural worldviews as integral to the interpretation of social phenomena and human behaviour. As noted by Apache scholar Viola Cordova, the worldview can be seen as consisting of

three basic items: a description of the world; a description of what it is to be human in the world; and a description of the role of humans in the world (Dean Moore et al. 2007:61). It provides the foundation upon which all else is explained and is an integral component of meaning making and knowledge production (Dean Moore et al. 2007:61). Cordova prefers to call this context a matrix because it implies a web of related concepts (Dean Moore et al. 2007: 61). This is similar to what Ludwig Wittgenstein calls the “world picture” that underlies all our inquiry (Dean Moore et al. 2007; Wittgenstein 1969). In the same vein, John Searle introduces the technical term “background” to describe the set of abilities, capacities, tendencies, and dispositions that humans have and that are not themselves intentional states (Searle 1995). Attention to background assumptions “is necessary to make sense of speech acts and the communicative economies based upon them” (Darnell 2008: 102). Different world pictures of “contexts” are exposed when two people from different cultures come together and find it difficult to communicate with one another, on account of the fact that their frames of reference do not meet (Dean Moore 2007:62). As Wittgenstein (1953:223e) observes:

We say of some people that they are transparent to us. It is however, important, as regards this observation that one human being can be a complete enigma to another. We learn this when we come into a strange country with entirely strange traditions; and, what is more, even given a mastery of the country’s language. We do not *understand* the people. (And not because of not knowing what they are saying to themselves.) We cannot find our feet with them. They are not readily accessible. If a lion could talk, we could not understand him.

This idea underlies Stanley Fish’s concept of the interpretive community: the cultural context that underlies the way we read a text (Fish 1976). Regna Darnell envisions interpretive communities as “an issue of both the world and imagination” and a bridge

between the literary and social sciences (2008:102). She uses the concept as a foil for examining the “cultural structures of imagination” as they relate to the real world issues of Native subsistence and decision-making strategies (2008: 102-113).

Context is a keystone of the Anishinaabeg social world. The question, “Where are you from?” is a standard query that provides essential culturally coded information. For example, one’s home place is coded with a number of specific details. One’s clan affiliation provides instant information about kinship, social organization, marriage rules (e.g. taboos), tribal affiliations and histories that inform rules of engagement. The political context (e.g. colonial history) is a necessary prerequisite for understanding every aspect of Native life. A comprehensive and informed understanding of environmental health issues cannot be divorced or separated from a parallel analysis of the “background” of social, economic and political factors (e.g. colonization, assimilation, residential school history, land appropriation and land claims, Indian policies) that compromise community health and well being.

The Value of Multiperspectival Approaches

In the words of Claude Lévi Strauss (1962), my research approach more closely resembles that of the *bricoleur*⁴³ than that of the engineer, in that my theoretical toolkit draws on diverse theories and methods from many different disciplinary traditions. The value of adopting a multiperspectival research methodology has been recognized in

⁴³ Bricoleur and bricolage are terms used in several disciplines to refer to the construction or creation of a work from a diverse range of things, which happen to be available, or a work created by such a process.

different academic domains.⁴⁴ The use of multiple frameworks and methodologies fosters more rigorous and praxiological insights into socio-political phenomena. They also promote a more sophisticated understanding of the complexity of knowledge production and the interrelated complexity of researcher-participant positionality. Higgenbottom et al. (2001) have made similar arguments for a transdisciplinary and complex approach in health research.

Reliability, in the traditional meaning of replicability, is meaningless in qualitative research (Janesick 1994). However, the “validity” of the research findings is enhanced by procedures which reduce the possibility of misinterpretation in the communication process (Egan 1999:39). These procedures are termed triangulation⁴⁵ a process of using multiple understandings to clarify meaning by identifying different ways the phenomenon is being perceived (Stake 1994). I drew on multiple lines of evidence (historical data, life histories, scientific reports, participant observation and action) in order increase the rigor of my research methods.

The deployment of multiple theories and methods may be seen as an academic response to the predicament of the famous parable of the blind men of Hindustan who are confined to their “vision” of the image of an elephant based upon their limited engagement with a very small part of it, highlighting the limits of individual perception

⁴⁴ For example, Joe L. Kincheloe has employed diverse theoretical traditions in a broader critical theoretical/critical pedagogical context to lay the foundation for a transformative mode of multimethodological inquiry. Kincheloe theorizes a critical multilogical epistemology and critical connected ontology to ground the research bricolage. Multiple methods avoid the reductionism of many monological, mimetic research orientations (see Kincheloe, 2001, 2005; Kincheloe & Berry, 2004).

⁴⁵ Triangulation is an alternative to validation. It is the combination of multiple methods that adds rigor, breadth and depth to a single study (Denzin and Lincoln 1994).

and (by extension) cognition. The story also serves as a caveat about partial and absolute truths. At an epistemological level, the parable illuminates the importance of communication in knowledge production and tolerance for diverse standpoints. Sharing accumulated experiences and drawing on the insights accrued through the application of different theories and methods can strengthen research by forming a more complete picture, or as Finn Sivert Nielson (2001) states, by creating a “meta-theory of the elephant” that produces a form of knowledge that is greater (and richer) than its individual constituent parts. In the following chapters, I illustrate how the data acquired through the application of a multiperspectival approach allowed me to gain a greater understanding of the multilayered issues that constitute the larger theme of environmental health at WIFN.

CHAPTER FOUR

Narratives of Pollution and Environmental Change

Chapter Overview

In this chapter, I present narratives that were collected through interviews with Walpole Island residents. I identify two distinct narrative forms or genres. *Generic narratives* describe environmental issues and concerns shared collectively by all participants. The themes constituting these discourses cross the broad spectrum of community perspectives. *Nuanced narratives* are those defined by specificity. They include discourses that represent distinct standpoints, broach particular environmental issues and convey very specific environmental knowledges and practices. I conclude with a summary of the findings and identify key points that will form the basis for critical analysis in the discussion section.

Classification Of Walpole Island Narrative Themes

Discourse analysis revealed a number of concerns framed as distinct themes. For the purposes of clarity, I devised a simple classificatory system for organizing the narrative categories.

Generic Narratives

The first category of narratives is “generic narratives”. These are stories that contained themes that were communicated collectively by the diverse cross section of WIFN population interviewed. I have identified four dominant themes in the generic narratives: health; food and water security; the communication of risk and community environmental principles and practices. Through fine-grained analysis, the dominant themes yielded sets of nested themes. Core themes describe the broad, overarching thematic issues or concerns extracted during the primary stage of discourse analysis.

Sub-themes are topics that were distilled from the core-themes at the secondary stage of examination. Micro-themes emerged at the final stage of discourse analysis and are distinguished by their specific narrative content and high degree of detail.

Interpretive Sub-Communities And Their “Nuanced Narratives”

I call the second genre of discourses “nuanced narratives” because they emerged primarily from interviews with individuals belonging to particular sub-groups of the Walpole Island community. These subgroups can be viewed as representing distinct “interpretive sub-communities” within the larger interpretive community of Walpole Island. They include: new and expectant mothers; members of the women’s environmental group, Akii Kwe; hunters and fishers; elders; heritage centre researchers and health centre frontline workers. Preliminary examination of the data shows that these narratives are greatly informed by a wide range of factors, including gender, age, occupation, subsistence strategies and spiritual practices.

Expectant Mothers and New Mothers

The pool of new mothers and expectant mothers interviewed attended the pre- and post-natal nutrition program at the WIFN Health Centre. The program offers nutritional education, maternal support and food hampers to expectant mothers and mothers of children under the age of two. The program is held monthly; mothers attend either a morning or afternoon session. The program allows the health care providers to follow-up on the health of mothers and their infants. Mothers are able to access care provided by the on site nurses; lactation consultants and dieticians from outside the community are also on hand. The program is run by the Centre’s Community Health Representatives (CHRs).

I chose to interview mothers because clinical evidence has shown that women of reproductive age, infants and children are most vulnerable to toxic exposure. The

discourses of these women centered around children's health, women's health and reproductive health and shed light on specific concerns regarding water quality and the integrity of local food sources.

Akii Kwe: The Women of Bkejwanong

Akii Kwe is an environmental group composed of women of different ages, occupations, and spiritual beliefs who represent the "wives, mothers, daughters, and sisters, the grandmothers, the aunties and the nieces of the WIFN community". The group formed in the 1990s as a response to Imperial Chemical Industries' proposed discharge of treated pond water into the St. Clair River. The women draw on Anishinaabe teachings, *Midewiwin* (medicine lodge) spirituality, Christianity and traditional cultural beliefs and practices to promote environmental advocacy, education, and ecological preservation. Akii Kwe's discourses described cultural teachings regarding the centrality of spirituality to the Anishinaabeg, the sacredness of the water and gendered environmental responsibilities.

Fishers and Hunters

The fishers and hunters interviewed were individuals referred to me by Heritage Centre researchers and those whom I'd met through other social circles. The fishers' and hunters' discourses provided very detailed information on the themes broached by participants in the generic narratives of environmental change. The content of their narratives provides critical contextual information on ecosystem health and the traditional fishing and hunting practices of local residents. The discourses provide a rare view of the range of residents' expertise, traditional ecological knowledges and close observation of cumulative changes to WIFN ecosystems and wildlife.

Elders

The elders interviewed were people I had come to know while working on different research projects over the years. I became acquainted with many elders during my

Master's research. Some of the elders belong to the community's residential school survivor's group; others I met while attending Ojibwe classes on the island and through volunteer work. The broad category "elders" is in fact a diverse group of males and females who cross cut several groups and represent different sectors of the community. However, their discourses have revealed very similar life experiences and perspectives on the topics of community health and environmental change. The discrete 'witnessings' of specific environmental events (such as chemical spills) and changes to local plants, animals and ecosystems that were shared through the elders' stories revealed high levels of consistency among members of the same age cohort. The elders' narratives also yielded another kind of genre that I will describe in more detail in the following chapters.

Heritage Centre Researchers

The discourses of the Heritage Centre environmental research coordinators and technologists reaffirmed the centre's mandate, which includes: researching the historical relationship between Aboriginal peoples and the land; formally defining the land base; securing the powers for proper environmental management; solving environmental problems with a balance of "traditional knowledge and values", modern science and technology; and countering external threats to community health (Bkejwanong 2005). The narratives described the spectrum of grassroots initiatives developed through the centre. Some of the community-based environmental projects have entailed reviewing existing bi-national water quality agreements and environmental policies; working with external proponents on environmental assessments; developing recovery strategies to help protect endangered local plant and animal species; tailoring federal environmental legislation so that it is culturally appropriate, community-specific and fulfills the economic, cultural and spiritual needs of WIFN; educating community members about

the island's biodiversity and the status of regional environmental threats; and promoting sustainable development and best practices. The narratives also reveal the strong linkages between environmental stewardship and self-government. The Heritage Centre is a locus for the dialogic emergence (Tedlock and Mannheim 1995) of environmental epistemology and praxis. As such, it represents what Jürgen Habermas would call a form of *communications community* (1976; 1981), while also being an interpretive sub-community that consists of members who draw on both Indigenous and Western knowledge systems in addressing and responding to environmental threats. In this context, the Heritage Centre represents a middle ground or interface where diverse Native and Western worldviews, theories, and methodologies are brought to the table to be discussed, debated, and potentially synthesized through dialogue, research, and collaboration.

Health Centre Frontline Workers

The Health Centre is the sole healthcare facility in the Walpole Island First Nation Community and is staffed by nurses and Community Health Representatives (CHRs) that are trained in a number of physical and mental health related areas. The Centre's mandate is to provide preventative care and health education. Services include prenatal classes, pre and post-natal nutrition programs, home visits, health screening (hearing, vision, speech, dental, blood pressure, blood sugar), school health screening and education on nutrition, dental care, hygiene, sex abuse prevention, smoking prevention, safety, rabies awareness, sexuality and sexually transmitted diseases, immunization clinics, contact tracing of communicable disease and family planning. The narratives reveal the challenges of mediating environmental crises within the existing infrastructure and capacity that are

presently available to a preventative health care clinic in a First Nations community.

The nuanced narratives illustrate the different standpoints and situated knowledges that constitute the Walpole Island “community perspective” on environmental health issues. They also provide insights on how different interpretive sub-communities communicate risk, gauge and assess environmental health threats, embody environmental fears, respond to environmental crises and engage in environmental action. I present these two genres of discourses concurrently within the body of the larger narrative analysis on account of the fact that they are deeply enmeshed and mutually reinforcing, but also because there are no firm boundaries between subgroups: the group labeled as fishers and hunters includes middle-aged men and elders: the Heritage Centre researchers are engaged in both scientific research and traditional ecological knowledge studies. Although useful classificatory devices, the group designations ought not to be interpreted or understood as bounded, stable, homogeneous entities, although their constituents do reflect coherence and consistency in their particular situated knowledges.

Generic Narratives and Embedded Nuanced Narratives

The all-encompassing core theme of “health” consisted of the sub-themes *human health* and *ecosystem health*.

Human Health

Human health was a dominant narrative theme and an issue of utmost concern for Walpole Island residents. Participants made a clear distinction between health in the past (pre-contact) and present (post-colonization). In general, volunteers identified a progressive degeneration of community health.

Morbidity and Mortality

The proxy for poor health was articulated as a perceived increase in morbidity and mortality. As one elder in her 60s explained:

We're seeing a lot of sickness and death in our community. Long ago, people were much healthier. I never saw my parents or relatives even take an aspirin when I was growing up. Today, everybody's sick from somethin' and they need to take a whole bunch of pills just to make it through the day. I don't think takin' that much medication is good for you either.

Many people noted distinct patterns of mortality. A woman in her 50s stated:

When you're out here, you'll notice that people here die in clusters. If someone dies in the community, we expect more deaths to follow in following days. You'll often hear it said that "people die in threes." It sounds weird I know, but it's always turned out to be true.

Another proxy for health was longevity. In contrast to biomedical statistics that record longer life spans of contemporary populations, most of the Walpole Island residents I spoke with expressed the opposite observation: that people are not living as long as they did in the past. As one elder in his 70s explained:

During my grandparents' generation, you could find people who lived past 100 years old, easy. And not only did they live that long, they continued to live on their own. They didn't lose their faculties, like people do today with Alzheimer's disease and that. They lived independently, fished, hunted, kept house, took care of their adult kids, grandkids and great grandkids. Now, they've got more illness. Their quality of life is worse. They're weaker, their bones break easier, and if they fall and have an injury, that's it. If they get checked into the hospital now, rarely do they make it out again alive.

Autoimmune Diseases

Participants identified the prevalence and frequency of certain diseases in the Walpole Island population that they describe as forms of illness that were "rare" and "uncommon" in the past. Residents described autoimmune diseases such as lupus, asthma, allergies and rheumatoid arthritis as being on the rise. One elder in her 60s noted:

I've seen many cases of lupus in our community. It's a term that most of our people had never even heard before. Now, there are a number of people in our community who are really suffering from it.

Rheumatoid arthritis was also cited as a major health problem. Many participants were puzzled by the prevalence of joint diseases, noting that these conditions did not appear to affect earlier generations despite the severity of living conditions and hardships endured.

One woman in her 50s observed:

My parents worked their hands to the bone. My father was a commercial fisherman, and he'd be on the lake from dawn to dusk, in the heat or summer and cold of winter. My mother had eight kids including myself. She would wash all our clothes in the river, even in the numbing cold of winter. But I never heard her complain of arthritis or joint pain, or see her mobility affected. People were stronger, hardier back then.

The prevalence of the disease among young people was also noted by those interviewed.

A male in his early 30s and long-time sufferer of rheumatoid arthritis shared his experience:

I was diagnosed with arthritis when I was still in my twenties. I used to be very physically active but now it's painful just to go from point A to point B. I'm a single father and it upsets me that I can't do sports with my son. I'm on some powerful medication and I worry that my health will only get worse as I grow older.

Allergies and asthma were also named as major health problems. As one mother in her mid-40s noted:

When I was young, I could eat whatever I wanted. Neither me nor my siblings suffered from allergies. Today, kids are allergic to everything! You have to be careful how you pack your child's lunch. I know that at the school, kids are not supposed to have things in their lunches that are considered as 'high risk' for allergies, like peanut products, etc, and they're not allowed to trade lunches. I think that this type of approach is wrong. I think you'd need to expose kids to things more so that they get use to it. Pretty soon, you'll need to wrap them in bubble wrap or somethin' to protect them. It's not right.

A young mother in her early 20s, whose son suffers from serious bouts of asthma shared similar sentiments:

It seems like a lot of people, including the kids are suffering from asthma. That's something that I really noticed. Every second kid has a puffer. One time I saw a truck come on the island and I heard it was for the stuff they need for asthma. My son has terrible asthma attacks, especially when he runs. He's gotta sit out of a lot of his gym classes and that's a big problem 'cause he's overweight and really needs the exercise.

Chronic Diseases

Chronic diseases were, by far, the greatest health concerns voiced by community members. Like other Native communities, diabetes mellitus has been described as occurring at "epidemic proportions" in the community. Several participants shared their experiences with the disease. A community health representative in her 50s offered her thoughts:

Almost every household on the island has someone suffering from diabetes. Those who don't have it in their family know of someone who has it. We had a speaker who was a diabetes specialist who came to give a talk to our community. We had to be very careful of making sure that his message wasn't too blunt. The children in the audience need to know of the risk. I am a diabetic and so is my mother. Looking out at their young faces, many of whom I know suffer from diabetes, I was really hurting because how can you tell them that? How can you tell them that it's almost a given that they're bound to suffer from a number of serious health problems and that they can literally die from this? It breaks your heart, but we need education and action if we're to have any hope of breaking the cycle of this sickness.

I bore first hand witness to the toll of the disease. An elder, mentor and very good friend of mine who was in her late 60s suffered with diabetes related complications, including glaucoma, renal failure, peritonitis (from an infection from dialysis), sepsis (from nosocomial infection) and the amputation of both legs. She passed away at the age of 62. The participants identified the prevalence of type I, II and pregnancy-onset diabetes in the community and shared several of their personal stories.

Walpole Island residents identified cancer as another disease perceived to be on the increase. Cancer narratives were diversely framed and proliferated in WIFN discourses. Many participants talked about the number of community members who have been diagnosed with the disease. As one elder in his late 70s explained:

I think cancer is our number one health problem in the community. It is definitely on the increase. It seems like every other day you hear somebody new being diagnosed. There must be something wrong when you see so many cases popping up in a community with such a small population. I mean, if you look at the numbers, what are the odds?

Other participants provided specific information on the incidence and prevalence of cancer diagnoses and deaths. Factors that heightened community members' alarm were the diagnosis of rare cancers and the prevalence of young cancer patients. As one breast cancer survivor in her late 50s noted:

It's not just that we have high rates of cancer, but its being diagnosed in very young people. Some are babies that have died of rare forms of blood and bone cancer. And that's another thing, the cancers we see out here are rare. I've heard of cancer of the stomach and pancreas, bone cancer, prostate cancer in young men. With the rarity and youth of the patients- I just don't know. I don't think a real thorough study has ever been done here so there aren't any hard statistics out there, I don't think. But a lot of people I've talked to feel the same way-that the patterns we're seeing are out-of-the-ordinary and definitely not normal for a community of this size.

Another "fear factor" was the 'good' health status and health behaviour of those who have succumbed to cancer. As one woman in her mid-20s described:

The scary thing is that it's not the druggies, or alcoholics or the one's who are eating fast food and junk that are getting cancer. It's people who don't smoke, who don't drink, who are conscious of what they eat and maintain a healthy lifestyle, that are being struck down. And you wonder, if there's no way to predict it, if you go through all that effort and you still get sick then at the end, what's the worth in doing it? I mean, what's the point of even trying to be healthy if you get sick regardless of whatever you do? It's really depressing.

Community members engaged in what Jim Trostle calls a form of 'lay epidemiology' (2005). A few participants demonstrated a form of "hazard mapping"- an identification of

differential distribution of cancers according to genetic factors and geographical location. As one female participant in her late 50s explained:

I've noticed that cancers run more in certain families than others. So, that may mean their cancer is probably more based on genetics than environment but that's just a guess. I've seen it in my own family. I'm a breast cancer survivor. My sister passed away from it a few years back. I had an uncle die of cancer, I think it was cancer of the pancreas, but I'm not sure.

An elder in his late 70s noted a correlation between cancer incidence and geographical distribution of cancer in the community:

I've heard that there's been a lot of families with cancer that live on Austin Road and thereabouts, and up in Highbanks in general. I'm wondering if it's something in the environment in those parts that's causing it? Another thing is that before the hydro was put in people got their water from different places, like little creeks that don't exist now, and what not. The people who lived near the water drew it from there. People who lived in 'back settlement', what they call Aajwakwa, the Potawatomi mostly lived there, they were far from the river so they got their water from wells mostly.

Another male participant in his late 40s observed:

And just because we got the water pipes in now doesn't mean we don't have concerns. We have septic systems and e-coli contamination is a big concern. I've heard in conversations that people who live near where the hydro lines end are concerned about contamination. Specifically, they're worried about bacterial contamination because the ends of the pipes, up in that part of the line are exposed and not well maintained.

The prevalence of cardiovascular conditions (heart disease and stroke) was discussed by several participants. As one young man in his late 20s explained:

My papa (grandfather) lives with us. He's a widower. He's had both a heart attack and a stroke in the past five years. He has high blood pressure and high cholesterol. He's on a strict diet that he hates and on a lot of pills that he sometimes refuses to take because he says that they make him feel worse. There's a history of heart trouble on my father's side of the family. I don't know about my father, he never talks about his health and never goes to the doctor. But it scares me. I know I'm young but I don't want to ever get sick like that.

Rare Health Conditions

Other rare diseases were also mentioned. A woman in her early 30s discussed her boyfriend's rare health condition:

My boyfriend has Rasmussen's Syndrome. It's a very rare form of epilepsy. He was featured in a case study done by some medical specialists. He's constantly taking medication to control his seizures, which started when he was a pre-teen. The seizures have prevented him from going to school or work. They've never told him what causes it but he visited a healer once and he saw a vision of something that really happened to him in his childhood so he believes the healer's explanation of what he thinks brought about the condition.

Another young woman in her mid-twenties described her brother's rare medical condition:

My brother who's now in his teens has a very rare health condition. One of the symptoms is stunted growth and I know that that really made him really self-conscious growing up. Every second year, he travels to a convention where people with his disease meet, sort of like a support group and place to get information on any new medical breakthroughs or treatments.

There was also discussion of other "epidemics" in the community. A woman in her early 30s described her family's experience of being diagnosed with H. pylori:

I wasn't feeling well for a long time and I decided to get it checked out. Several members of my family were diagnosed with it. So, I finally went to the doctor and he said I had a bacterial infection, H. pylori. I was given medication and it's cleared up. I've heard that other people on the island have had it. It's just one of those things that you never hear about and then all of a sudden there's an outbreak. I've seen that happen with other sicknesses in the community. It's like they just come out of the blue.

Communicable Diseases

Despite statistics on the high rates of communicable diseases like tuberculosis and HIV in Native communities, these themes were conspicuously absent from the WIFN health narratives. Inquiring about this further incited this response from one of the Health Centre nurses:

Unfortunately, we don't have any solid statistics on infectious diseases. The only time we get reports on such incidences in the community is when we need to do surveillance or follow up with a person because they pose a public health threat. So, in that case, we'd go to their place of residence to see if they're taking their TB meds and ask them to wear a mask when in close contact with other people, especially if they're living in a public housing facility, like the retirement home. Most of the times, people refuse to take the necessary measures and it's an uphill battle. People don't talk about infectious diseases like TB because of the fact that there's still a huge stigma still attached to it. And in a small community, where everybody knows everybody else and is in everybody else's business, confidentiality is a huge issue.

Children's Health

Children's health was a dominant theme in the discourses of new and expectant mothers and those of Akii Kwe. Women were primarily concerned about how exposure to environmental contaminants may have affected their children's health. As one mother in her early 20s who was five months pregnant explained:

I get really scared when I hear that there are chemicals in the environment that can affect my baby's health. I can stay away from things that I know are dangerous, like alcohol and drugs, but it's hard to protect yourself when you're not sure what the threat is or where it is, like water pollution, air pollution and that kind of stuff. And then even if you do know the dangers, what can you do? You can't stop breathing or drinking water? There's no choice, really.

Anxiety over birth defects was often expressed, as was the possible association between chemical exposure and other adverse health effects such as cognitive deficits, poor gross motor function, and behavioural problems. As one mother in her late 20s stated:

You always hope that you'll have a healthy baby. That after they've done counting all the fingers and toes, that everything else is all right too. I know some people that have kids with health problems and mental problems. People don't wanna talk about it because it's an uncomfortable subject. Nobody wants to say out loud or talk about the fact that their kid is defective in some way. Yeah, I guess you could say there's a stigma there. I've heard second hand that some folks think it's because of the water but that's a hard thing to prove, I guess.

Several women talked about what they perceive as high rates of special needs children the community and the possible association to toxic exposure. One mother in her early 40s commented:

You see a lot of kids with special needs in this community. I think a lot of people wonder why so many in a community this small? I don't know if they've ever done a study but I think it would be a good place to start if someone wanted to really start findin' some answers about what's goin' on with our health.

One expectant mother in her mid 30s addressed the issue of the possible misdiagnosis of health problems. She identified ADHD as a potential outcome differential diagnosis:

How do you know that a lot of the diseases they say kids have out here aren't due to chemicals? We don't have a doctor on the island. Even if we did, most doctors aren't specialists for that sort of sickness so chances are he'd get it wrong too. I think a lot of cases of ADHD are pollution related. Even my mom says that she's seeing a lot more of these cases and she's worked in social services. There's definitely more now than in other generations. Maybe it's something in the water or the fish we eat?

Women's Health

Mothers who had experienced difficulty in conceiving identified pollution as a possible factor. As one mother in her late 20s explained:

My husband and I were trying to have a baby for almost two years. I was getting very concerned. I come from a big family where this kind of thing was never really a problem. One day I was talking to my grandma and I told her about the problem we were having. She told me to stop drinking the river water. I switched over to bottled water and was pregnant within weeks of the switch. I don't know if there were chemicals in the water or if it was just psychosomatic. I don't want it to sound like an advertisement for birth control: if you don't want to get pregnant just drink the river water! But I'm just telling you what my experience was.

Another expectant mother of similar age disclosed a similar story:

We were really looking forward to starting a family. When I had trouble getting pregnant I didn't think much of it. I know that it's harder for some people than others for some reason. But I've always been conscious of my health. I try and eat the right foods and get enough exercise. My husband and I don't drink, smoke or do drugs. So, pollution in the environment did cross my mind during that time period. I'm still concerned about the issues, even after my first child was born. We only drink bottled water. I come from a household where we ate fish almost every day. We hardly eat it at home now because of the fear of the chemicals.

Some women believe exposure to pollutants has caused complications during pregnancy. A number of women discussed what they perceive as disproportionately high

incidences of miscarriages and stillbirths in the community. Estimating miscarriage rates is hindered by several issues. The reporting rate is usually quite low as early term miscarriages often go unreported. Because there is no physician stationed in the community clinical records are distributed across different Canadian and American jurisdictions, which makes the tracking of miscarriages all the more difficult. There is sometimes a reluctance to report miscarriages because of the sensitivity of the issue and concerns about confidentiality. Children are an important part of Anishinaabeg culture and female identity. Some women reported that not being able to carry a child to full term is sometimes viewed as a failure or even as 'punishment' for a moral trespass and stigma may be attached to the mother. To date, no formal study of miscarriages has been conducted in the community.

Given the associations made between toxic exposure and reproductive health in the women's discourses I strove to learn more about this topic when it was brought up. However, there were cultural factors that hindered the collection of this information. One common behaviour is the reluctance to speak of negative events such as death for fear of disturbing the dead and provoking or attracting negative 'energies' to oneself. I was told that because I was a female of child bearing age it was a topic I ought to pursue with caution, lest a similar fate befalls me. I sensed that some older women didn't wish to put me in this situation, as one interviewee asked me if I had protected myself properly prior to engaging in conversations about this topic. Hence, most of the information that I obtained on this topic came about in a very round-about and indirect way. Although one woman in her 50s shared a very poignant story about how she felt contaminated water had adversely affected her son's health:

I was pregnant with my youngest child and I had gone into town to get an ultrasound done. I didn't know it then, but there had been a major chemical spill that day. The people who did the ultrasound told me to drink a large glass of water and when I think about it now, I know that I was drinking contaminated

water that poisoned my baby. My son was affected by the chemicals. He has a very rare health condition and I strongly feel that it was caused by the water I drank that day, the day of the spill.

Other mothers did not related first-hand experiences but discreetly shared stories they had heard from family members, friends and other women in the community. Several women reported peaks in the number of miscarriages correlate with years when major spills occurred. One mother in her late 40s commented:

I've heard from those near me that there were a lot of miscarriages a little after The Blob and after some of those big spills that happened in the 90s. Another thing I heard was that women were not only having one miscarriage, they were losing multiple babies. The most that I heard of was a woman who I think lost three babies in a row. People mention stuff like that because they don't feel that things like that are normal.

The narratives of Akii Kwe offered a cultural context for understanding the effects of contamination on the health of females and their children. Just as sick water is unable to maintain a healthy earth, so too a sick woman cannot maintain a healthy family. As one woman noted, "Our elders tell us if the Women became sick, then the children will be sick, and the Nations will cease to exist." Another member explained the Anishinaabeg view of conception and how chemical contamination compromises the health of the fetus:

According to the Anishinaabeg tradition life begins in the womb even before the fetus is developed. If the mother's fetal waters are poisoned, the child will also be poisoned. In addition to chemical pollution and drugs and alcohol, we believe in blood memory and the transmission of trauma from generation to generation. The trauma of the past is another type of toxin that can pass through the blood and placental barrier.

The issue of skewed sex ratios was also addressed. A 2005 study conducted at the nearby Aamjiwnaang Reserve in Sarnia suggests that exposure to hormone disruptors found in environmental contaminants may be causing disproportionately high rates of female births among Band members (Mackenzie *et al.* 2005). Anecdotal evidence suggests that some Walpole Island residents believe the male to female birth ratio in their community mirrors the trend observed at Aamjiwnaang. As one expectant mother in her

early 30s stated:

I have relatives in Sarnia and to tell you the truth, I've noticed that they've got way more girls in that community than boys. You can tell just by looking at their softball teams- all girls. I think the same thing is going on around here. I have an uncle who said that if you wanted a boy you'd put a bow and arrow under your mattress. I don't know what the medical records are like but there's a group that sews newborn baby clothes. They'd have some idea of where more girls are being born.

Many mothers worry about how a skewed sex ratio will affect the community's demographic profile and the future sustainability of the local population. As one expectant mother in her late 20s explained:

If it's true, then it would be bad for our community. You need to have a balance of men and women in the community for reproduction purposes, but also for social roles. If we don't have enough men in our community we'll need to look to other Native communities or consider non-Native partners. My mother's generation was really affected by the Indian Act. She married a non-Native and lost her status and had to fight hard to regain it. I don't know how the rules are now, but there's biology and then there's the social and political issues that would result if there were major differences in the number of males to females born in a population.

Etiology

Some participants subscribed to biomedical explanations for disease causation while others identified a variety of other factors they believe are the root causes of sickness and disease.

Pollution

Industrial pollution was often cited as the primary cause of certain health outcomes.

Water pollution was the number one environmental concern. All of the participants expressed fears over the effects of nearby industry on water quality. There were several "micro-themes" that were embedded within generic narrative of "water pollution". Some participants listed the diverse sources of water pollution. As one fisher in his late 60s noted:

With the issue of water pollution, well, what do you wanna to know? I mean, you gotta understand it's more than one thing, you know, we need to be clear on what we're talking about here. So, what've we got? There's the chemicals that are dumped into the water from the factories in Sarnia and the States and that, okay, that's one, okay? Two, there's the crap, raw sewage that's dumped into the river. I remember once, the people from Environmental Canada gave a warning, stay outta the water, they said, 'cause e-coli levels were high because of bird crap and that. And I was in my boat with some other guys and we seen this huge turd going by, it was raw sewage, eh. And I said to myself, yeah, that's one big bird, eh? yeah, right... Anyway, so add to that the commercial ships. We're always worried about a tanker spills that's totally possible, given the high ship traffic. And the gas spills from the pleasure boats. When all is said and done, it's a toxic soup out there.

A CHR at the Health Centre described her role in e-coli surveillance:

One of my jobs is going out once every two weeks and collecting samples that we then send out to the Ministry for testing. If there's a high e-coli content then they post no-swimming signs along the beach. It hasn't been that bad lately, but I remember other summers when it seemed like there was a "do-not-swim" notice out every other week. So, it depends on a number of factors and it also varies from season to season.

One mother in her early 30s discussed the prevalence of skin conditions among children:

Oh, yeah, in the summer you get kids with skin rashes, and bumps. Also, there've been a lot of ear infections. A lot of people think the kids are being affected by the chemicals in the water. You'll go to the doctor, and they'll say "Oh, it's swimmer's ear," but I don't think that's the case all of the time. I mean, my brothers and me used to live in the water when we were young. We never got those types of reactions.

Another participant in her late 60s noted:

Parents let their kids just wade in the water a little bit but they're going to get showered when they get in and they get ear infections and throat infections and they are just not comfortable. Things that are happening and impacting – it's not our doing, it's from around us.

People framed the issue of water pollution in terms of their distinct memories of chemical spills. As one participant in his late 50s explained:

When you say water pollution, I think of all the spills in the river. We've lived through a lot of them. The Blob in the 80s, well we didn't actually witness that one but it was stuff that probably had been spilled a while back. There was a

whole bunch of them in the 90s and the latest was the one in July 2003, during the Blackout. We had another big one six months later, in February 2004. So, we got a lot of different chemicals floating out there in the St. Clair.

One participant in his early 30s brought attention to the issue of controlled spills:

It's not just the accidental spills. We also worry about controlled spills. The way it works is that chemical companies get permission from the Ministry of Environment to release so many hundreds or thousands of gallons of treated water that contain chemicals. They call them 'legal spills' because they give them certificates of approval. Basically, if the corporations make a deal with the Gov't they say "sure, why not? spill as much as you want." They say that they have a certain limit that they can't go over. Look at the ICI case in the 1990s. The government allowed that company to release over 3 billion gallons of treated water that had never been sufficiently tested for harmful chemicals. We fought it all the way but at the end they got away with it. Even if there are regulatory standards, who enforces them? Remember, the industries are self-policing so who would know if they went over the limits? And I'm sure they have a room full of lawyers that can find all sorts of loopholes for them to get around the regulations.

A man in his early 20s had this to say about chemical spills:

Accidental spills, legal spills, allowable discharges, it's just a name game. I don't think that there's any difference between controlled and accidental spills. I also don't believe that spills are all that accidental to begin with. It's not a coincidence that most of the "so-called" accidental spills happen in the wee hours of the morning, where there's nobody on call to report to, which allows things to be delayed, when there's nobody that can spot anything in the river, or nobody to rush to see what's going on. It's all a joke...

Participants identified chemicals used in agricultural production (both inside and outside of the community) as contributing to water and soil contamination and posing a health risk. A young mother in her early 20s commented:

It's not only the factory chemicals. Look at all the chemicals used by the farms. They use pesticides and fertilizers and they drain into the ditches and leach into the ground water. That stuff is poisoning us too. I don't know what our farm uses, if they still use the old, dangerous chemicals. But we lease out parts of our land to non-Natives who grow all sorts of stuff, like soya and vegetables. Who knows what they're using and I don't think anyone's monitoring their farming practices. So, we have hazards inside and outside of the community.

Some participants talked about other health hazards. The community's dump was a recurrent theme. As one man in his late 20s stated:

Our dump is horrible. It's a real eyesore and a health hazard. We don't have garbage pick up so people can dump whatever they want there. Plus, they go there to burn things, sometimes toxic things, so that affects air quality. I'm always worried that the rainwater from the dump seeps into our land, contaminating it and our groundwater.

Air pollution was identified as a cause of respiratory illness. A fisher in his 50s noted:

All the pollution you can just see coming in from Sarnia—and they got it real bad down there. My cousins live there and it stinks like rotten eggs and they get awful headaches too. I don't know how they stand it. We used to have air monitoring stations out here so that we could take the reading ourselves. It was a good program, but then stopped. I don't know why. Probably didn't get money to continue with it. Or maybe, we were getting info. on the chemicals they spew out into the environment... the industry or government may have shut it down. I don't know but I wouldn't put it past them.

An elder in her 60s eloquently described the syndemic effects of multiple health risks:

There were no serious diseases when I was growing up, probably because people had more knowledge of plants and medicines. Diseases, like diabetes and cancer were extremely rare. Now, cancer, different kinds of cancer are at an all-time high. I think it's partly to do with what we eat and the chemicals in the environment, those that are in the water we drink and the air we breathe.

We have a number of health risks All around us, wherever you look there are environmental threats- everything is affecting our community. It's time for us to stand up, have our voices heard and say "no" to all of the things that are destroying our environment and our health. We are finally being paid attention to. Legislation has come out that makes it a legal imperative for industries to consult with us before going through with a development plan, etc. And we've acquired many powerful people that we can call on to help us. Many people who have come to our islands to fish and hunt and who have fallen in love with our community. But we like to fight our own battles and it's important for us to take a stand now, because too much damage has already been done. The survival of our earth and our children depend on the decisions and actions we take today. Staying quiet or ignoring the situation is no longer an option.

The narratives articulate a strong association between chemical exposure and poor health outcomes. There was also a clear recognition of the community's vulnerability due to its geographical location and the practices of environmental racism. This understanding was eloquently conveyed by an administrator in his mid-60s, who stated:

The close connection we, as Aboriginal people share with the environment has helped to maintain biodiversity, but also makes us most vulnerable to environmental destruction and its associated health problems. Like canaries in a coal mine, Aboriginal communities are at the forefront of water quality and pollution issues. What happens to us foreshadows what will happen to the rest of society, in time.

“Social Pollutants”

One new mom in her 30s expressed her concerns about diminishing air quality due to overcrowding:

There are a lot of indoor health issues. There's overcrowding- it's typical to have a household that has 8-10 people but has only one bathroom and two bedrooms. People are building their homes in places that are not above the water table. The result is high levels of moisture and mould in the house. The funding for homes is at the bare minimum. If you want to add windows that comes out of your pocket. So, you have homes that are basically a cube: no light, no fresh air.

Many interviewees categorized drugs, alcohol and smoking as forms of pollution. In accordance with this categorization, I refer to these causes as “social pollutants”. One mother in her late 40s noted the adverse health effects of smoking:

We have a lot of smokers. Although there's a law that bans smoking in public places, that's rarely enforced. So, you can be trying to enjoy a meal with your kids and there's someone puffing away like a smoke stack next to you. Add to that what we're breathing in being downwind from Sarnia and it's an unhealthy living environment.

One male informant in his late 50s shared his insights on the topic of “social pollutants:”

I don't see no difference between the chemicals from those factories across the river there and them drugs and alcohol that are killing our community. Drugs and alcohol are chemicals too. Think about it. I guess you can say they are social chemicals. Look at what they have in common with those other chemicals. They're both unnatural, you know? Both were created by man. They are polluting- they screw up your system and even the health of your kids because it poisons your insides. They're products of the white man, they come into our Rez from the outside, just like the bartering of alcohol. They're poisoning our people.

Along the same lines, another participant in his early 40s observed:

Alcohol and prescription drugs feed big markets and the almighty dollar is the bottom line, just like with those industries over there. I'd add the tobacco company in there, too. Because, tobacco, semma in its natural form, eh the way it was intended to be used by the Nishnaabe people isn't toxic. It's those companies that want to exploit people and make them addicted that add all those chemicals to the tobacco they sell. For profit, pure and simple and let the poor suckers who get hooked be damned. As long as they make they're quotas. I've been sober for a bit over two years. But, I still smoke my pack a day. It's one thing I can't give up.

Poverty, Social Disruption and Breakdown of the Family Unit

Poverty and breakdown of the family unit were identified as two examples of social disruption that negatively affect community health. As one new mom in her early 20s observed:

Poverty is a huge problem. When you think about the things that you need to be healthy to have a good sense of well being: good food, a clean and warm home, a loving and supportive family. A lot of the people out here don't have that. Kids don't have enough of the good things to eat because their parents can't afford it or because they don't have their priorities straight and they'd rather spend the money on a want rather than a necessity. That comes down to parenting skills and given the fact that kids are having kids they haven't developed good sense. Many don't know how to parent because they come from broken homes, homes with alcoholic parents, homes of violence and abuse. So, add to poverty social breakdown, lack of parenting skills, unemployment, crime, substance abuse and disease and sickness and you have a recipe for disaster. That ultimately leads to an unhealthy family and an unstable and unhealthy community.

Although environmental concerns were ranked as a high issue of concern, many of the women admitted that these issues take a back seat to pressing issues faced by the community. The tension between being "forward looking" while trying to overcome everyday crises was discussed by an expectant mother and mother of three in her mid-30s:

I don't think that you'll find any person who says they're not concerned about these issues. But you have to understand that people's attention and concern are torn in many different directions. There are so many social problems out here it's

hard to keep count. The drugs and alcohol are huge issue. There's people addicted to crystal meth and oxycontin. People are so drugged up they break into houses in broad daylight. They don't care, just want their fix. There's no opportunities for youth. Nothing to do except for getting pregnant and taking drugs. No social programs or chance for betterment on rez. No jobs for young people, whether educated or not. They have people from SOHAC come in to talk about Fetal Alcohol Spectrum Disorder but alcoholism is a disease of poverty, addiction and a coping mechanism for abuse. They all come from traumatic backgrounds. We need to fix these social problems. If we can do that, the rest will fix itself.

Along the same lines, another mother in her late 20s noted:

We have the seven generations teaching but there's almost always a crisis, a burglary, a death, an accident that we can't think about things like water quality when there's the concern where will I eat or sleep tonight, or will I someone be so drunk that they run me over, or break into my house. Sometimes, things like the environment are put on the backburner for these reasons. You can't think long term if you're stuck in the short term, worrying if you'll make it day to day. We're living with the bad circumstances and choices of the past.

The mothers were in agreement on the need to educate people in the community about how to best protect children from chemical contamination. As one mother in her mid 20s stated:

We need education. We hear about the dangers of chemicals but we don't have solid information on our own local risk. No guidelines on how much fish to eat, where to go with concerns, etc. As women and mothers, we're responsible for the health of our whole family. We need to have the latest information and consumption guidelines and protocols that are specific to our needs at different stages, like when pregnant, nursing, etc and information on what's safe for our families.

Changes to Diet and Activity Levels

The vast majority of participants interviewed cited the transition from a "traditional diet" (fish and wild game) to a Western diet (processed foods) as a primary contributor to community morbidity and mortality. As one elder in her mid-60s explained:

Diabetes, heart attacks, strokes- these are all new diseases to us. I blame the change in our diet. When I was a young girl, we had a vegetable garden. We grew tomatoes, corn, beans, squash, carrots, lettuce, you name it. We'd also pick berries: wild blueberries, blackberries, gooseberries, elderberries. We'd go

and gather marsh potatoes, wild leaks, morels, puff balls a kind of large mushroom. My father would catch fish and we'd also eat a lot of different animals: muskrat, squirrel, rabbit, duck, deer. This is the most healthy diet, it's land food. My grandfather would say we had our supermarket and our pharmacy in our backyard. We used everything. We'd eat leftovers and my mother would use the hides from the animals to sew clothes. Nothing went to waste. We were healthier then. The only white medicine I remember taking was the cod liver oil they gave us at school every day.

An elder in her early-70s noted the changes in dietary patterns brought on by the residential school system:

It all changed when we were put in the 'mushholes'. We had a horrible diet. We hardly had any decent meat. As Anishinaabeg people, we need to eat protein. I remember going to a doctor a few year back and he looked at my arm. I had these white lines going down one side. He said, "You know why you have those? Because you aren't eating enough protein. As an Indian person, you need that." He knew it too. I remember my mother saying that we need to have the animal blood because that's where it carries all of its nutrients and energy. In the schools, they'd feed us mush-oatmeal every day. There were hardly any fresh vegetables. I know I eat a lot of tomatoes now because I never had any growing up in there. And they worked us hard, and we were always hungry. A lot of the kids would try to steal food. And we got sick in there and weren't given good care. My dentist asked me whether I was really sick when I was young because he saw tiny lines on my teeth that he said indicate a stress when I was young, and I remember I got really sick with fever when I was 5 or 6. That change was the beginning of a very bad relationship to food. Even being forced to eat everything on our plate has turned many people obese, because that was ingrained in us. We still live with those memories that has affected our eating behaviour.

Another participant in his late 40s talked about the detrimental effects of poor food choices and adherence to a Western diet and lifestyle:

People are hooked on fast food and junk food because it's easy and cheap. The other problem is that people aren't as active. They don't get the exercise the need, they take their car everywhere. Kids are adopting these bad habits. Most of them hardly play sports, they're spending most on their time inside, watching t.v. or in front of the computer.

A CHR explained biological differences that exacerbate the effects of a poor diet:

I agree with the research that's come out on the different nutritional and activity needs of Aboriginal People. The "thrifty gene" theory makes sense to me. That says that our bodies were made to withstand periods of starvation. We had a

mechanism that always held onto some food in time of need. So just because our lifestyle has changed our biology is still wired in that way. So we retain a lot of the food we eat, which combined with poor food choices and reduced exercise leads to obesity and chronic diseases, like diabetes and heart disease.

In general, the narratives of human health identify some of the major health concerns in the community. Individuals have a good knowledge of the various forms of pollution that affect their community and cite pollution as a contributing factor to declining community health. They also categorize alcohol, tobacco and drugs as social pollutants. However, residents are equally conscious of other detrimental factors like changes in dietary patterns and activity levels, many of which are rooted in processes of colonization, such as the residential school history. There is also a distinct emphasis on collective well being. Although specific examples of individual and family health issues were cited, most residents used patterns of morbidity and mortality at the aggregate level of community as the main indicators of health and well being.

Ecosystem Health

Two major proxies for environmental degradation that emerged from the discourses were the health of native animals and plants.

Fish, Amphibians and Mammals

Many participants reported a marked increase in “sick” and “abnormal” species.

Numerous references were made to the prevalence of malformed and sore-covered fish.

As one male participant in his early 50s explained:

We're seeing a lot more fish that are sick. I seen some that are deformed, like they got a bent body and bumps on them. I seen them with red-like sores on them, and once when we went out we caught one that when we opened him up, it looked like he had these tumors in him, so we didn't eat it, we threw it away. That's often now. Before, you'd hardly throw anything back but now you're throwing out almost half your catch because they don't look right.

A participant in his late 50s reported changes in the colour and size of the fish:

Compared to when I was young, I noticed that the fish caught in the river are smaller, leaner and they're a brownish grey colour now. They kinda look I don't know how to describe it, just not healthy and their eyes are more glazed over.

The fishers provided detailed descriptions of suspicious lesions and malformation found on fish that they interpreted as signs of pathology as a result of chemical exposure. One fisher in his 60s noted:

I've seen a lot more sick fish in the river. There are some that are deformed, like their body is all twisted. There are fish with these sores on their body. There are ones that have these black spots on them. Nobody wants to eat them... we just throw them away.

Another fisher in his late 50s shared the following observation:

People have been telling me that they've found fish that have scabs on the bottom of them. They say that it might be caused by the pollution up North. I'd find some of these fish with spots on them when I'd go fishing when I was younger, in my 20s. This issue came up when I became Chief. People were concerned and they'd bring me the fish that were sick. They looked like that, like they had cancer.

One fisher explained how, 10 years ago, he began to notice fish that were "infected on the side, with scales missing off them." He also described how some fish were "sent off to be tested in a lab in Toronto." When asked whether anomalies in fish physiology are reported, one fisher had this to say:

Sometimes I'll contact the Heritage Centre, and tell them about it. But, really, what can they do except maybe take a picture of it? What most people do is tell people they know so that the information is passed on by word of mouth more than anything else.

Meanwhile, another fisher in his 60s answered: "I just throw it away when I find it.

People are panicked enough as it is. I don't want to add to that worry."

There were also reports of declining numbers of fish. As one elder in his mid 70s noted:

Before, you could do a lot of off-shore fishing and catch lots of fish. That's not true anymore. Now, you need to go into deeper waters to get a catch.

The fishers provided more detailed information on specific changes to the numbers of fish. A longtime fisher in his late 50s describes the impact of the declining fish population on the community's economy:

In terms of fish, if I compare it to 20 years ago, the sheer amounts of fish just aren't there now. To me it's very discouraging, because before you were able to make a living off of fishing but now the numbers are just not there anymore.

One fisher in his late 60s provided an example that illustrated the plenitude of fish in the past:

I remember Lake St. Clair in 1960s and 1970s. We could make a livelihood without real effort, that's how much it's changed. Not that it was the issue of getting rich but it was enjoying the life of being out there enjoying being a fisherman, that was the most important part. Everyone talks about my father getting the biggest carp haul on Lake St. Clair I think it was an excess of 52 tons. They were primarily selling for \$100 a ton in those days and that was really big money, that was \$5200 dollars in 3 days, so it was a really exciting time. There were a lot of commercial fishermen on the lake, mostly families and that was the biggest haul they'd ever seen. The average carp hauls back then were ranged from 10 to 25 tons. Still a very good haul by today's standards.

Some fishers provided very detailed information regarding specific fish species.

One fisher in his mid 50s noted that the walleye (pickerel) population has become "non-existent:"

The pickerel population is not there anymore. There used to be tons of them, but their numbers are now really thin. It's not just here at Walpole. They're having the same problem down in Moraviantown [a nearby reserve].

Some fishers believe the decline is a result of changes to fish habitat and spawning areas:

The Ministry of Natural Resources did tests on the walleye at that time, thirty years ago. They showed that the walleye larvae, I believe that's the term, would be in a sac form and possibly floating down Lake St. Clair and that they were being contaminated by human and man-made waste. The test showed that they

were exiting in through Lake St. Clair in the millions. But even at that time, they said the larvae were encountering problems even though the fish were coming into Lake St. Clair, they weren't making the high numbers. I think most of our walleye now are migratory. We catch most of them in the area that extends from Lake Huron to Lake Erie.

Some fishers suggest that non-point pollution from agricultural development has prevented the walleye from thriving. As one fisher in his late 40s observed:

I think the walleye are being affected by all those chemicals and pesticides running off the farms. There are lots of pig farms too, and I've heard that the waste from pig droppings are an environmental hazard to the water source.

One fisher in his early 50s noted that the dwindling numbers of walleye at Moraviantown (a nearby reserve) could be due to overfishing. While another fisher believed that the pickerel and perch populations were being threatened by Alewives (a type of predatory fish) that feed on their eggs.

Some fishers mentioned the decline in the smelt population that was once plentiful in the 1950s and 1960s:

Smelt fishing used to be real popular in the early 60s. We'd go down in April, in the Spring when the run was on. I don't know what happened but the smelt population really decreased. It was like they quit coming to these parts. The numbers dropped way down.

A few participants attributed the decline of smelt to birds like the cormorant, while others blamed the introduction of predatory fish species, like salmon. Some fishers pointed to the rising temperature of lake and river waters from chemical pollutants as a reason for the diminishing numbers of fish species:

The bodies of water have gotten much warmer, I think because of the chemicals. This is screwing up the spawning and migratory behaviours of the fish. Some are spawning earlier in the season, others are changing their migration routes. A lot of the fish need colder water to survive. It's also affecting the plant life that's native to these water systems.

Another fisher in his 40s attributed the changes in water temperature to global warming:

The increasing water temperature has definitely affected the fish populations. You see this especially in the smaller fish species that are going further out on the lake.

For example, catfish were always plentiful during the summer. But now, the only place you can catch them is with gill nets in the deeper waters.

Others believe that declining fish populations have resulted from changes to the island's physical features. Flood control measures, such as dike-building and installation of water pumps were implemented in the 1950s and 1960s. Many fishers feel that these changes affected the wetlands and native fish and plant species in several ways. As one fisher in his late 50s explained:

Over the years, a lot of places like the hunting clubs have done a lot of diking to their marshes which has really changed the natural landscape of the island. This has an impact on the fish themselves. The dikes stop the rivers from flowing through the fish waters for them to breed. This blocks them from being able to travel to those spawning areas, impacting their population numbers.

Another fisher in his mid-60s notes:

The geography of the land has really changed and this has caused changes in the ecology. In the 1960s they put dikes in. The reason for this was because the island, being primarily marshland was always wet and flooded. They needed to divert the water for the farmers who wanted to put in crops. Before that time, there were a lot more streams and wetlands. Back in those days, before the dikes people could step out their back door and there would be minnows, and frogs and fish swimming right there, outside their house.

Many participants made specific reference to the adverse effects of the water pumps. One elder in his early 80s observed:

A lot of them areas at different ends of the island have been closed off with pumps. There used to be fish that would come into our ditches. Fish like pike and what not. Now they don't come no more, 'cause of them things they built that drain the marshes.

A female interviewee in her early 60s described changes that she noticed in the turtle population:

I know they say there are endangered turtles, like spotted turtles, and that. I haven't really noticed a change in the numbers, but I have noticed a change in taste. I eat the turtle and the eggs. There's a different colour now, its more yellowish/brown and not pink. And also, it doesn't taste the same as it did when I was young. I can't explain how it's different, but also the meat isn't as tender, and it's got more gristle.

Some fishers and hunters commented on the state of the island's turtles and explained that they've observed a significant decline in their populations:

There weren't very many of them and nobody would buy them anymore. I don't know why. The turtles are a lot smaller now than they used to be. Back in the day, they were just huge. You know, great big shells. You don't see them get big like that no more.

One elder in his late 60s described a general decrease in snake and lizard populations, while several participants noted a decrease in the frog population. One elder in his mid-70s described his observations of this change:

I used to hunt bullfrogs but not any more, because there are fewer of them around now. You know you hardly hear them anymore. When you do find them, they're immature, and they're not very big. You don't get the big ones anymore. I haven't seen the big ones in a long time. I noticed this change starting about 15 years ago.

A fisher in his late 30s noted:

I remember rooting through the grass with a stick, looking for leopard frogs. We'd catch them and use them for bait. There would be huge numbers of them, just jumpin' away. But they're not there like they used. I noticed this change, this trend of fewer frogs about a decade or so ago.

Some point to industrial pollution as contributing to the diminishing frog population:

It's not just at Walpole, you know. I've heard that little amphibians and frogs are declining, disappearing all over the world. Their numbers are just going way down. Soon they'll be an endangered species. I don't know what it is, but everything is changing. I don't know if it's the chemicals in the water, in the soil or in the air, but somethin' for sure is bothering them, to the point where people have noticed a drastic difference in the frog populations here on Walpole.

Several participants discussed pesticides as the potential cause for the decline. As one informant in his mid 40s noted, "The leopard frogs had been plentiful here. Now, I think, you'd need to really search to find a couple of them frogs. I think the chemicals they use on the farms are killing them off."

There has been a steady overall decrease in the numbers and varieties of animals on the island. Participants offered several examples. One elder in his early 80s noted, "In a simpler time, there were more fish and more creatures. You look back 20 years and the island was incredibly alive. It's still alive but you don't see the numbers of species out there."

Several people described changes they've observed to the island's bird populations. The bob white quail is one species that was identified as being on the decline. As one hunter in his 50s explained:

Bob-white quails are almost gone. I haven't heard one in a couple of years now. Used to hear them all the time. I haven't really heard of anyone hunting them for a very long time.

An elder in his late 60s provided a time frame for the change, noting that quails and pheasants were once very plentiful on the island, but that their numbers have rapidly declined since the late 1960s. Participants described an overall decrease in numbers of ducks. As one hunter in his late 40s explained:

One thing that I remember when I was young were the huge numbers of ducks. You would just look up and see them flying right over St. Anne's Island. There were so many that it looked like a big black cloud. They would blacken out the sky. And the sound of them, you wouldn't believe. You'd hear their wings it was almost like hearing thunder. There would be up to 500 of them overhead. It was a real sight to see. Oh, those hunter had no problem getting any. It was those rare times when the guides could actually guarantee the hunters their ducks. And we caught lots. My relatives, my uncles would shoot 20 or 30 in one shot. It was incredible. I'd go out hunting too, in the park there and out there in the Middlegrounds, there'd be just tons of them. They'd call them rafts, rafts of ducks and like I said there would be hundreds of them. In those days, there was plenty of wildlife. People could live right there off the land. The boys would learn how to hunt, how to blow the call. It was a different way of life. I've seen a lot of changes in my own lifetime. First off, the duck, the numbers aren't even close to what they once were. The youth don't know a thing about hunting. There are too many hunters, and too few ducks. It's to the point that most of the hunting is being done by the hunting clubs, strictly for business.

They also noted that ducks come later in the year, leading to a shorter hunting season:

The most northern ducks don't come down until November and very few ducks are there early on. Duck hunting starts in September and usually goes until December 15th. For some reason, the ducks are coming in later in the season. There are fewer of them here in the earlier months. The first two months can be a really hard for the guides.

One hunter in his 70s described the diversity of species and plenitude of ducks before the 1970s:

There were so many different kinds of ducks back then. There were black ducks and mallards. I liked them because they were bigger. Mallard ducks were also popular. Their numbers were down for a while there, but I've heard their population is growing again. There were also wood ducks, teal and widgeon. There were the open water ducks too. Those were the bluebills, the canvasbacks and the redheads.

Several hunters attribute the decline in the duck population to environmental contaminants in the water. As one hunter explained:

The duck populations have really been low for the past twenty years. It's because of the pollution from chemical valley. I've read all about the studies done on birds especially, and how chemicals affect their reproduction, like how it causes the egg shells to be more fragile, it leads to cross-bill and cross-beak, the chicks that hatch have deformities... things like that. It's a well-known fact in the Great Lakes region. Pollution is killing the wildlife.

Others feel that agricultural pollution is leading to the decline. As one hunter in his mid 40s explained:

I think because of the agriculture, all of the fertilizers and pesticides that are seeping into the wetlands and groundwater, that's affecting the duck populations badly.

One hunter in his 60s observed that noise pollution is scaring away the ducks:

I think that a lot of the ducks and geese are being scared away by all of the noise. This has really increased since 9/11. The Americans have really boosted up their homeland security. There's lots of planes flying in our airspace. It doesn't help that we're so close to the Detroit International Airport and South Ridge Air Force Base.

A seasoned hunter provided a detailed description of the migratory cycles of the duck populations. In his opinion, the decline in numbers is due to climate change:

I'd say that there have been major changes to the climate and the weather over the past quarter century. These changes have affected all of the living things: the fish, the deer, the ducks. Some specific changes I've noticed is that the ducks are not as plentiful as they used to be. They're moving to different areas to colder areas. It used to be that when you'd go out to places like Dynamite Cut, to the Middlegrounds there would be hundreds of ducks and geese there. What's there is a small percentage compared to the past. Maybe it's the climate that's changed that's affecting their populations, maybe it's the pollution. Who knows? Maybe it's the fact that people don't leave corn out for them to feed. That used to be a common practice. Farmers would leave corn on the stalks to attract the ducks to stay in the local area. From what I can tell, that's not being done anymore.

Loss of habitat was cited as an explanation for decreasing duck populations. As one older hunter in his mid 60s noted:

Loss of habitat is up there with climate change. It's had a huge impact. Birds will stay where there is food and shelter and water. I've noticed that they're staying more north longer.

Other hunters noted how competition affects the numbers and varieties of species in a given area. As one hunter noted:

Trumpeter Swans are territorial birds. They're very aggressive and usually take over the areas rich with plants life that were formally occupied by mallards and the smaller ducks.

A prevalent narrative theme was muskrat hunting. Although not commonly practiced in the present day, muskrat hunting was a major source of food and profit for several WIFN generations. It was very profitable during the 1940s and 1950s, but started to decline beginning in the 1960s due largely to the anti-fur movement and the subsequent low demand for fur. Several hunters spoke of how the anti-fur movement of the 1960s affected the local economy:

The anti-fur movement and their campaign against the leg-hold trap really hurt the local muskrat economy. The lower demand in furs led to the decline in muskrat prices. It was no longer a profitable venture. Entire families would go out muskrat

hunting and this downturn had a very negative impact on households that depended on this economy to make their living.

Many hunters reported that the numbers of muskrat are significantly lower than they were in the past. They presented a number of different theories for their decline. One hunter in his late 60s identified a positive correlation between decreased muskrat hunting and the dwindling numbers of the species:

There's a relationship between harvesting pressure and the numbers of a species. Take the muskrat as an example. The elders would always tell us that if you stop hunting them, their populations decrease. Back in the 40s and 50s, we were trapping a lot of them. There was a fairly high demand, the prices were good and that was an incentive to trap. When the 60s rolled along, the situation changed. Pressures from animal rights groups caused the demand to drop which was followed in a drop of prices. It wasn't profitable, so fewer people hunted them. There was little harvesting pressure and the populations dwindled. Back in the day, when you went muskrat hunting, you'd leave and not see one sign of muskrat houses or feeding beds. Then, you'd come back in the Spring and there were literally thousands of them. We say that nature would turn on the reproduction and our elders knew this and kept the hunting pressure on to keep the numbers high.

Some hunters believe pollution has adversely affected the population:

The muskrat population went downhill during the 1970s. I think pollution from the chemical plants played a large role in that. A lot of people feel that the toxic stuff really hurt the ducks and the muskrat.

Another hunter in his 50s observed that muskrats were dying from sickness:

I think a lot of 'em were dying from disease. I remember hunting and busting open a den and they'd be real skinny and lots that were dead. I hear someone say that there was a kind of muskrat fever and that this could be caught by humans too and lots of people did catch it. But one doctor told me that you build up an immunity to the sickness. That must have been the case with us, because no one in our family caught it and we hunted every season.

Some elders attributed the decreasing numbers to loss of habitat:

The phragmites (quillweeds) that have overrun the native plants have really affected the muskrat population. Muskrats depend on the roots of the cattails that are overrun by these quillweeds. So, if there are no cattails, they have no food or shelter, and this affects their numbers.

Invasive Species

A number of participants discussed the appearance of invasive species, like the zebra mussel. A woman in her 30s explained:

The zebra mussels are really hurting the fresh water mussels. Out here we call the fresh water mussels clams. When I was young there were so many clams...my sister and I would go hunting for clams all the time. Now, you hardly see them. And when you do, they've got like tons zebra mussels attached to them.

Fishers talked about the effects the zebra mussel is having on local on fish and aquatic life:

The water is much more clear now because of zebra mussels. Zebra Mussels are filter feeders so they eat all the suspended algae and such in the water. This has caused a sharp increase in the small-mouth bass population. In the fishing community, if you're bass fishing, this is extremely positive. But what we have yet to learn is the long-term effects of zebra mussels in our waterways.

Another fisher in his early 40s elaborated on the zebra mussel issue:

Well, I hear a lot of people saying yeah, the zebra mussel, although a pest it's doing some good, like making the water clearer and all that, although I don't know whether it really cleans the water of chemicals- I bet it doesn't. It's not doing any good for our native plants and fish. If it clears the water, more light shines through. There are deep-water fish that need the dark. They're adapted to that. Same thing with the plants, this may not be good for them. The added sunlight makes certain plants grow, others die off. This affects the fish population that feeds on them. Again, everything is connected. The introduction of a foreign species makes everything go off kilter and nature loses it's balance. Not a good thing, in my opinion.

Plants

Both male and female participants have observed changes to Walpole Island's native plants. These were discussed in terms of changes in plant physiology, and biodiversity. population. One elder in her 70s identified specific changes in the physical appearance of plants:

In general, the plants now are skinnier, less hardy. I remember back in the old days they had really strong roots that were hard to cut through. Now, if you pull them a bit they break up at the root. Another thing I noticed is that the plants are smaller. It looks like they're dwarf versions of the originals. I remember the

puff balls growing to a huge size. You can still find big ones now, but it's more rare. The growing season is shorter, I think too.

Several participants noted decreasing numbers of medicinal plants and even the disappearance of certain plants. One elder in her mid 70s explained:

I've noticed that the plants aren't as plentiful as they used to be. My mother was a healer and we'd always go to a certain spot on the island to pick medicines. It's a touchy subject- medicines. People are protective of certain patches, and white people have stolen Native medicines and patented them and made millions off of them. So, I'd prefer not to talk about specific species. But, what I can say in general, is that I've noticed a decrease in medicines, and there are a couple of plants that used to be around that I can hardly find now a days.

Another plant gatherer in her 60s who relies heavily on traditional medicines observed:

Wikan [sweet flag] isn't as prevalent as it used to be. I think the family, the plant families, it's harder to find. And it's not replanting itself. I'm sad to see that it's not vibrant, it's not coming back. You could just walk and look for it. But now you've got to really go search for it. You got to go do hard walking. The medicines aren't as strong. I need to gather more now to get the same effect. This is difficulty because the Anishinaabeg value is to take only what you need. So, I don't want to take too much, but the old formula for the amount I need doesn't work now, because the plant energy is less strong. There's also less variety of plants, I've noticed that the selection's not as rich.

One woman in her late 50s noted a change in the local trees:

I no longer see any black willow. They're cutting it down and it's not growing and that's not here either. Our white willow's not here. We got yellow willow and we got red willow but no black and white willow.

The generic narratives were profuse with accounts of invasive plant species. Purple loosetrife is a major concern as is the presence of phragmites. The latter has been blamed for changing the island's landscape. As one male participant in his 40s explained:

That phragmites has totally changed the landscape. Before, you used to be able to see clear across the marshes. It was an open view. You could see the cattails and the ducks and everything, crystal clear... just beautiful. Now, this weed has cropped up. It's taken over the cattails, it's real thick, you can't walk through it, and it obstructs the view.

A hunter in his late 50s noted that the weed is affecting the habit of other plant and animal species:

Water levels are way down. But that's not just here- that's the story for all the Great Lakes. Quill weeds are a major problem. They're stronger than the other plants and are taking over. Some people have different theories about how to get rid of them, like if the water level in the marshes and the quill weeds get higher, the weeds will die. But they've got strong roots and have grown really tall, so I don't really think that changes in water levels will be able to get rid of them. But there has been one good thing that's come out of it. It's helped the deer population grow because they have better cover. In my experience, there have been more deer on the Island- more than what I've seen in a long time. But the thickness of the weed makes it difficult for other animals to make use of it as a home, like ducks and that, so I guess you'd call that a negative impact.

Changes In Animals and Plants: Summary of Causes

Industrial Pollution

Many interviewees attributed the changes observed in fish, animal and plant population to industrial pollutants. Many participants expressed the dangers of what western science refers to as bioaccumulation. As one male in his mid-30s explained:

I think that a lot of the changes you see, especially in the fish is caused by the chemicals that the factories release into the water. I don't have a degree in science, but it's just logical that all of those different toxic substances build up in the fish that eat the contaminated plant life that is their food. The bigger and older fish (especially predatory fish) have more chemicals in them than the tiny fish. So technically, they're more dangerous.

One woman in her 50s attributed the change in physical characteristics of Native fish species to industrial pollution and provided a specific example:

My husband had an elder call him and ask him to come look at a fish he had. She couldn't figure out why it was red. My husband said that the fish in the marsh are red because it's their natural colour, but the fish in the St. Clair are leaner and more white, possibly because of pollution.

Some people expressed a concern over specific chemicals, like mercury. As one elder observed:

Whoever knows the history of Lake St. Clair is concerned about mercury contamination. Mercury was found here at high levels in the 1970s. They say things have gotten better now that Dow and other companies are no longer there, and that they're regulating things better, but I still don't trust that the fish are safe to eat.

One female participant in her late 40s talked about the fear of mercury-contaminated plants:

I pick my mushrooms on Walpole Island and Seaway Island. I know that Seaway is where they store the mercury-contaminated sediments that they dredge from the river. They have them in these big containers. They say that they're safe, but I'm still scared of mercury contaminating those mushrooms we gather.

Another woman in her early 60s described the effects on air pollution on trees:

The trees are dying from the top down. That's something that people have never seen before. I believe that it's the pollution in the atmosphere the poisoned clouds and the acid rain. I also noticed that the tree trunks have big gnarly knots in them, something they didn't have in the old days and I think that it's being caused by pollution.

One interviewee reported that some individuals had stopped growing their vegetable gardens because of contamination fears:

A man I know could no longer farm because of the pollution coming from Sarnia. He would refer to the chemicals coming from Chemical Valley that were affecting his vegetables and say that they wouldn't grow anymore. So it wasn't profitable for him to have a garden anymore and that's what he told me. This was in the late 50s.

Agricultural Pollution

Several of the participants identified agricultural pesticides and fertilizers as causing changes in plant and animal life. As one female participant in her 30s noted:

Well since the farmers came in and they all do whatever they want to the fields. Whatever they spread in there to kill weeds, well that must go out in there to the areas where we found, you know, stuff that we ate that grew wild. But you know there are so many things that are missing, plants and animals and that.

One female participant in her late 40s noted, “there don’t seem to be as many elderberries as there used to be. Probably because of all the farming and pesticides they use these days.” An elder in his 60s observed that, “milkweed used to be plentiful along a lot of the roads, but I think pesticides have put an end to that”, while another elder attributed the declining population of wild onions to pesticides.

Overdevelopment and Overharvesting

A number of participants said that overdevelopment and overharvesting had adversely affected the island’s plant population. One elder in his late 60s commented:

Well, a lot of the development causes some of the negative impacts and most people aren’t aware of the rarity of the plants or the medicinal qualities and that information is virtually dying out. People who know it still use them a lot.

Another elder in his 70s talked about the overharvesting of a specific medicinal plant:

One medicine I use is Spicebush-for thinning blood. I used to pick it at one time. I noticed that the bushes are declining out there. I attribute the decline not as much to pollution as to overharvesting.

Overdevelopment and overharvesting were seen as symptoms of the much larger problem of the erosion of the cultural value system and loss of what the Western world refers to as ‘traditional knowledge’. One elder in her 60s described the various medicines native to the island. She also described the equally vast degree of knowledge that people once had regarding the different plants, their uses and their healing properties:

We use several plants as medicines. There’s Sasaquon (Horsemint), White Sasaquon (Pennyroyal), Rattleweed, Colt’s foot, Poison Ivy, Sassafras, Sarsaparilla, Leeks, Fennel, Labrador Tea, Prickly Ash, Wikan (aka: Sweet Flag), Milkweed, Saw Saw, Comfrey, Plantain, Water Lily, Valerian Root, White Oak, Mullein and Yarrow.

One of the Akii Kwe members noted the use of “Sweetgrass, Cedar, Sage and Tobacco for spiritual and ceremonial purposes.” Many participants described the very specific uses of plants for certain conditions. For example, one elder described the use of red willow as a poultice to treat blood poisoning and “other kinds of sores that won’t heal.” Plaintains

are used as a liniment for arthritis. Sassaquon and Wikan are used as teas to treat colds, sore throats and other virus or bacterial related ailments. One Akii Kwe member in her 60s described the special relationship between plants and humans:

Plants play a huge role in our everyday lives and in our healing and ceremonies. They are our medicine and cures. They are special because they have a symbiotic relationship with humans and they lay down their life for us. That was their role from the time the first people walked the earth.

She continued to described the oral transmission of knowledge in the healing arts, and how it has been lost through the years and how the plants themselves are disappearing:

My grandmother was a renowned healer. People would come from Detroit and Toronto and all over the region to get medicines from her. She was referred to as 'Dr. Wal-a-sa'. I've been told the name means 'something that shines on everything around it'. She had an amazing repository of medicines and also a great deal of knowledge about plants, medicines and the healing arts. She passed along this knowledge to my aunt and she in turn, passed some of this knowledge down through the generations, but the knowledge is partial-it's been lost along the way. My father and my uncle also had this knowledge. I remember they'd go out looking for three plants that they believed could cure cancer. They were up there in age and they'd be searching and searching for this one plant they couldn't find. But they always held out hope that the cure was out there. We just needed to find the right combination of medicines. But this is getting more difficult as time goes by, because the plants are dying away and the people have lost the traditional teachings.

Many participants articulated that the diminishing populations of plants is due to the lack of proper harvesting techniques. A woman in her early 30s provided a specific example:

We have a lot of sweetgrass on the island and people like to pick it. But, they end up destroying patches of it because they don't know the proper way to harvest it. For example, it's a root plant, a rhizome, so you're never supposed to pull it from the root. You need to have a sharp pair of scissors and cut it cleanly at the base of the stalk. Also, you're not supposed to pick it too early in the season, otherwise it won't go to seed. People also pick it to sell it, but according to our traditional ways, you aren't supposed to sell or purchase medicines.

An elder in his 70s reported that plants are not regenerating because people aren't following the appropriate cultural protocols:

When you go to pick a medicine, you're supposed to lay your tobacco down. As a sign of respect to the plant that's giving it's life away to help you. I'm a heavy smoker but I used tobacco in a sacred way also. There's a spot out there where I to and lay my sacrifices down and have my smoke out there. I try to go out there every day but that usually doesn't happen. I take fruit out there and I lay it down. And do my prayers out there. A lot of people today aren't doing that, and the plants aren't growing back because of it.

A male informant in his mid 30s provided a similar story of the symbiotic relationship between humans and animals, and the disconnection that has resulted from a loss of traditional knowledge:

I know people who talk to plants and they say that the reason we can't find the medicines like we used to is because the people aren't honouring the plants like they're supposed to, so the plants are choosing to physically move away, to go to other spots. Another elder told me that the plants aren't there anymore because we've lost the teachings, we've forgotten that knowledge.

One elder in her 80s said that people have lost their connection to nature, and that the plants are no longer talking to people. A disparate view that was expressed, but one that encapsulates the same sentiment is that the plants are still talking to people, but people (due to their changing behaviours and distancing from the Creator and spiritual world) have lost their ability to "hear" them.

The disconnection from nature has resulted in the abandonment of cultural practices necessary for the responsible stewardship of the earth. Many participants feel that the distancing from nature and abandonment of traditional subsistence practices has limited the capacity for accumulating knowledge attained through observing and communing with the natural world. As one elder in her early 70s explained:

The Creator has created a plant cure for every disease, we just don't know which plant is for which disease. But we have lost our ability to observe and to listen. When I was young and out in the bush with my grandmother, we saw something that served as an important lesson. A frog jumped into some poison ivy. He quickly jumped into a patch of plants nearby and started rolling around. My

grandmother said that the other plant was the antidote to the poison. She said that wherever the Creator plants a harmful plant, the cure is always a few steps nearby.

A strong theme that pervaded all of the discourses was the interrelationship between human beings and all living things. As one Akii Kwe member explained:

When we pray, we finish with the closing “Kina Enwemgig- All My Relations.” This not only refers to our human relations, but also the creatures that swim, crawl and fly, the plants and trees, the mountains, lakes and streams, the moon, stars and planets of the universe- simply put, everything. Everything is relational and can only be understood in this way.

Unsustainable Hunting Practices and Land Use Practices

Along with pollution and land use, unsustainable hunting practices due to a lack of traditional knowledge was identified as a major cause of changes to the animal population. One hunter in his late 60s spoke of the importance of adhering to traditional ecological practices and cultural protocols. He also talked about the negative effects of irresponsible hunting on the duck population:

You need to know when to hunt, when not to hunt, when to leave a place to rest, to rejuvenate. This knowledge is something you just naturally pick up on the creatures that are in that area. You tend to see a pattern year after year, and that's important to establish what the benchmark the number of animals the number of fish. The recent lack of ducks I say is a sign that the species needs to rest. People are hunting ducks all the time, any reasonable day in winter I'm glad to say that they're not hunting them when they're hatching and that's good. I respect that, but there are people who hunt ducks in cars and I confront them and tell them forcefully to not do that. So with the ducks, with any reasonably weather given day someone is hunting and that's not right And ducks are smart. If they're coming into this area and they know it's an unsafe place, if they're shot at and constantly harassed they'll stay away. Our people need to know there's a time to hunt and a time to stop.

Fire has always been used to regenerate the growth of Native grasslands. Unfortunately, many residents have lost the teachings that go with the practice, to the detriment of plant and animal life. As one hunter in his early 40s explained:

We use fire to stimulate growth. When done properly, marsh fires rejuvenate the land. Unfortunately, a lot of the people that set them don't have the teachings, and they end up setting them at the wrong time and killing much of the wildlife

in the process. For example, you're never suppose to do it in the early Spring when the wildlife, and ducks especially are having their young. Young people are taking a match to everything. They're also using fire to smoke the deer out.

There has also been a loss of knowledge of animal life cycles. One hunter in his early 50s attributes the low deer populations to this fact:

There are rarely any deer around anymore. I don't think this is an environmental impact, I think it has more to do with the fact that people, especially the young people are killing them indiscriminately. For example, you're not supposed to kill a female deer, or pregnant deer or her fawns. But, they're off shooting whatever they see. So they don't last long out here. Most people go hunting for deer in Sarnia, in Bickford Park (Woods) or in the farmer's fields off reserve.

Another hunter in his mid 60s identifies the loss as symptomatic of multiple generations, not just the very young. Those who have no experience living off the land fail to maintain the interactions with nature that are necessary for broadening their knowledge base:

It's not just the kids, you know. A lot of adults just don't know what they're doing out there. They can't read nature. I don't know, they probably lost a lot when they went to residential school. Like back a ways, you used to trap until April or June that's when the mother is having the babies, you get her and you'd know, you'd see the nipples on her. I'd hunt until April and then I'd quit, the mother would have seven or eight babies. I knew when to start and when to stop and how much to hunt. Take just as much as you need and no more. And offer your thanks to the animal for giving their life for you. Show respect. That's rare now.

The fishers and hunters' narratives reveal a very sophisticated and detailed knowledge of WIFN ecosystems; plant and animal life and their life cycles; and numbers and patterns of behaviour. Explicit examples were given of declining fish and animal species and these stories were often accompanied by different hypotheses regarding the factors contributing to environmental change. Industrial and agricultural pollution, in addition to other variable such as changing land use patterns, changes to the island's physical landscape, invasive plant and animal species and climate change were all identified as possible causes of changes to ecosystem health and environmental degradation. This group of speakers pointed to socioeconomic processes and historical

contingencies as the root causes of decreasing biodiversity. In the language of critical medical anthropology these discourses allow us to make a clear distinction between ultimate and proximate causes of changes to the environment and its species populations.

In summary, the ecosystem health discourses reveal that many WIFN residents have observed significant changes to the health of native plants and animals. They use specific variables as proxies of these change, such as population numbers, physiological changes, levels of biodiversity and even very specific indicators such as the availability and potency of medicinal plants. Pollution is cited as a major contributing factor, however, equally ‘toxic’ are inappropriate land use practices, the erosion of cultural values and the loss of traditional teachings that reinforced the physical and spiritual connection between humans beings and “all their relations” and provide the culturally coded protocols for being responsible stewards of the earth.

Water and Food Security

The security of Walpole Island’s water resources and local food sources was another generic theme that emerged through the interviews. Community members provided information on a wide range of issues and concerns.

Water Quality

Walpole Island’s geographical location downstream from Sarnia, Ontario’s “Chemical Valley,” and the designation of its primary water source, the St. Clair River, as an Area of concern has led to heightened anxiety over the integrity of the community’s drinking water. As one male participant in his mid 40s noted:

We’ve always known that water quality was going down, just by the changes that we seen ourselves. When you get the bureaucrats themselves saying that it’s an Area of Concern, it means that it’s come to the point where they can’t hide it anymore and have to admit to the problem. You can imagine how big of a problem this really has become for them to have come to the point where they can’t deny it anymore.

Clarity, smell, taste and even feel were used as proxies of water quality. There was sometimes a division of opinion regarding whether the state of water quality has diminished or improved. One elder in his late 60s shared his memories of the poor state of water in the 1960s:

I think that things got real bad in the 1960s. As a child, I have vivid memories of all the stuff that was dumped in the river. I specifically remember these plastic things, they looked like plastic pellets floating along the river- like a lot of them, in the river and in the marsh areas. I never knew where they came from, but they'd just float there and form little clusters in areas. They'd also wash ashore. I haven't seen those in a long time, so maybe someone complained, or maybe the factory that was making them or using them went out of business? I don't know. But I bet lots of ducks got sick if they ate them 'cause they were plastic.

Another elder in his early 70s said that he has observed an improvement in water quality since the 1970s:

When we used to swim as kids in the water, there'd sometimes be a slick on the water and sometimes just great areas of floating debris. There were dark oily substances, grease and things like that floating on the river. There was also a lot of raw waste floating in the river. In those days there were no rules for industries. The lakes and rivers were openly used as dumping grounds.

Meanwhile, others participants commented on the different ways in which they have observed that water quality has gotten worse. One woman in her early 50s described the water as "not clear anymore... it's kinda dirty and foggy." An elder in his late early 80s gave a detailed description of longitudinal changes in water clarity:

The water was clean back then. When I was 16, I used to get drinking water out of the Dredge Cut. There used to be boats and outboards that used to travel up and down that riverway. The water was clean. Up at the ferry landing here. Used to go stand on the ferry landing and look down and see the bottom of the river. You could see what was down there. Clear, clear as a bell. Nowadays, you look into the river and you can hardly see an inch or two into the water. It's that bad.

A similar story was shared by another elder:

You go feet down into that river, down to the depth of 12, 14 feet, clear as bell. You can see that up north sometimes though. Can't do that anymore with all these companies up there. They tell you it's not ruining anything, but I don't believe that.

One woman in her early 60s reported a change in colour of the water:

The water used to be bluer and cleaner I think it's because of all the pollution from industry, from the factories in Sarnia, in Chemical Valley. I know those ancestors before me say that things were so different before the factories, before everything got built up and developed.

An elder recounted a very interesting story where he described how a nearby industry attempted to “conceal” changes to the visual appearance of the water brought about by pollution:

I once met a guy and we got to talking and at one point in the conversation he told me what his job was. He said that he worked for one of the chemical companies in the region and he was hired to dump blue dye in the St. Clair so as to hide the fact that the river was changin' colour because of all the chemicals they were dumping in the waterways.

Some people noted a change in the taste and smell of river water:

The taste of the water has really changed, for the worse. We didn't have a water line growing up so we hauled water directly from the river. It was sweeter then. It's not like that now- it's not even refreshing anymore. Another thing I noticed is that it's not cold anymore. The smell I don't like at all. It smells like chlorine. I think they add a lot of it at the treatment plant to kill bacteria and stuff. It's really overpowering.

One woman in her 40s noted a change in the feel of the water. Compared to water “up north” that she described as ‘lighter’ . She has noted that the water feels “more viscous and greasy to the touch”, which she notices when swimming in the river.

Several people reported that the river no longer “freezes over” like it did years ago. One elder in his mid-70s talked about the lack of ice formation on the St Clair River, beginning in the 1960s:

The ice conditions seemed to be thicker in those days. I used to cross the river in a horse and sleigh. Then later they used to drive their cars out into the marshlands to spear rats [muskrat]. They don't do that no more.

Another participant in his late 60s described changes he observed after the establishment of the petrochemical industry:

Since the factories have come in, you can't even walk across the channel. The water doesn't freeze up anymore. That's caused by the chemicals in the water. They used to put out markers to show where the ice was solid. During really cold winters you would get really deep levels of ice, a couple of feet at least. That doesn't happen anymore.

One participant attributed the change in water clarity due to natural processes, like rain storms and shore erosion:

You could see that it gets a bit muddy after a good rainfall. What I've noticed is how much the shores are just being worn away. It's really eroding. And you can see it along the edges of the shore, it makes the water look real milky.

Other participants noted changes in water levels, which have been described as steadily decreasing through the years. As one woman in her late 40s noted, "well I noticed the same thing, that there's gonna be more beach because the water's going down."

The most prevalent question participants had with respect to water quality was, "Is the water safe to drink?" Many participants felt that contamination concerns have caused them to doubt the integrity and safety of the water supply, despite the fact that the community had a new, multi-million dollar water treatment plant built a few years ago.

One young mother in her mid 20s remarked:

I personally don't think the water is safe to drink. How could it be with all that pollution? They say that we've got a state of the art water treatment plant, but everybody knows that even the most sophisticated technology can't remove chemicals from the water. So, that really doesn't make a whole lot of difference to me.

An elder described how her drinking water habits have changed through the years:

Well they think it's polluted because everyone's getting sick from it and that. And then pregnant women drink that and their babies are sick and stuff like that. We used to get our water from the creek. We'd walk down there and get it out of the creek and we drank it. We didn't boil it or nothing. It was just really nice and clean. Now it's different. When I was about 10 years old and had come back from school, they didn't get water from the creek anymore. The water was obtained from the pumps they'd installed.

A fisher in his 70s shared a similar story:

When we'd go fishing, if we got thirsty, we'd just get a cup and take a drink from the river. Just like that. Back then the water wasn't as dirty or polluted. Now, I don't think anyone would ever drink straight from the river like that. Now when we go out in the boat, we bring a whole bunch of bottled water with us.

Fear of contamination has led many expectant and new mothers to question the safety of drinking, cooking, or bathing with the local water. Almost all of the women interviewed prefer to buy bottled water for their families, although purchasing water was not feasible for many of the mothers interviewed. The economic factor of purchasing water was a huge issue. Many of the women I interviewed had more than one child under the age of five and were living on a very limited income. One new mother in her early 30s framed this issue as an example of discrimination against the poor and vulnerable:

Bottled water is an added expense. You need money for the water and the gas to go to town to pick it up. But it really is an issue of economics. It's a material based culture. If you want to protect your kids from drinking polluted or unsafe water, buy bottled water, they say. If you want your kids to not eat foods grown with pesticides, buy organic, they say. But organic and specialty foods are rare in a rural area, and there's a huge difference in cost, no matter what they say. If I have to choose between buying diapers or organic tomatoes, I'll take the diapers. If you're rich you can buy protection and to a certain point, ensure good health. At least as long as you can find sources that haven't been poisoned yet.

As another young mother explained:

I'm a single mother of three kids. In order to buy water, I need to make an extra trip to the store in town, and that's an added gas expense. If you think about how much that costs a year, it really adds up. Plus, you can't buy water for all the things you need it for like cooking and bathing babies, etc. So, your choice is limited. I know some people that have spent a lot of money on installing a water filter, again, an added expense. I know others who don't want to drink the tap water 'cause they don't think it's safe but that's their only option.

The community's mall has a place where filtered water can be procured, but at least one person I interviewed had doubts about the safety of the filtered water because she had "seen little particles floating around in it." Recent media reports on the unregulated status of bottled water and the detection of biphenol A in water bottles have created new sources

of concern for residents. As one new mother in her late 20s stated:

My God! We don't trust the river water. Now they're saying that companies are selling water that isn't even regulated, so we don't know what standards they abide by. And just in the news I heard there are reports that the plastic used for baby bottles and bottled water is leaching into the water, causing potential health problems. We're running out of choices for our source of drinking water.

The multiple issues associated with purchasing bottled water made it clear that this option was in reality, a "choiceless choice," given the fact that purchasing water is economically prohibitive for most households and that the safety of these alternative sources is also in question.

Integrity of Local Food Sources

Concerns about contaminated food sources broach the longstanding and contentious issue of whether locally-caught fish are safe to eat. Doubts about food safety were tied to the industrial history of the region. As one elder in his late 70s noted:

Well the water seemed to be pretty well clear back then. And there were plenty of fish back then. People weren't afraid in the 50s and 60s. It was mostly up around the other side of the island people used to gather water in pails, even in these little swamps and creeks, the water was still running through there. And then the scare in the 60s and 70s with the pollution that they were finding. People just quit drinking the water direct like, from the river and eating the fish too.

Another interviewee noted how reports of fish anomalies combined with news of frequent spills heighten community fears:

I don't know what the effects of pollution are. I myself never seen a sick fish, but when you hear people sayin' that they found fish with tumors, fish with scabs on their bellies, sick fish you can't eat, it gets you wonderin'. They got nothing to gain by lyin'. With all them chemical spills, you'd expect it would do something bad to the fish and animals. It's like somebody comin' to your house and dumping chemicals and garbage on your kitchen table and in your bed and not expecting that you'd get sick from it after living in it for a while. That's how I see it, anyways.

The lack of culturally appropriate and community specific fish consumption guidelines, and how this exacerbates existing worries about the security of local food sources, was a

constant theme. As one male in his mid-30s explained:

The fear comes from many unknowns: lack of knowledge about when spills actually occur, what was spilled, how it's affected the local fish and wildlife and most importantly, what the tangible consequences are for us, as people who rely on traditional economies as our food source. The ban on commercial fishing in the 1970s due to high mercury levels was a wake up call. The Ministry of Environments on both sides of the border created new policy regimes. Fish consumption advisories have been in place for decades. The problem is that these advisories are based on the eating patterns of a non-Native white population. We need to have standards tailored to our consumption patterns, which is substantially higher than non-Native populations. We also need to have them tailored for the specific threats in our region. The chemical soup in Lake St. Clair and the river are not the same as those in the other waterways. There needs to be more attention to cultural and geographical differences.

The issue of safe fish consumption guidelines was a particularly important issue for new and expectant mothers. Another mother in her mid-30s added:

Everyone knows that the provincial standards don't apply to Indians because we eat more fish and wild game. We need a guideline that takes our culture into consideration. But the same needs to be said for a guide for Native pregnant women, because we have different dietary needs and eating habits than the general non-Native population.

In extreme cases, concerns over the safety of fish have caused women to stop eating fish altogether; many have also stopped serving fish to their families. As one expectant mother in her early 30s explained:

I grew up eating fish. I remember my grandparents telling us that fish is important for the healthy development of baby's eyes and brain. This was way before scientists came out saying the very same things. Now I don't eat it at all, not local and not store-bought because I'm afraid of poisoning my baby with mercury.

A related, equally problematic issue is the absence of any Canadian guidelines for wild game consumption. As one hunter noted, "there are no guidelines for wild meat consumption in Canada, and that's a problem when you talk about food safety." Another hunter noted that wild game continues to be a staple of the local diet. He also expressed his views on the political dimensions surrounding Native hunting in general:

We still eat wild game. It's a major part of our diet. Ducks, muskrat, pheasant, deer. Not just from here, but from other places. People hunt up north and bring back moose, caribou and share it with family, friends and others in the community. I've been eating it all my life-nothin' bad's happened, so far. But, they don't have standards for eating game and that. The white man hunts but mostly for sport. He don't likely eat it. Indians hunt mostly for food. So, white people don't care if it don't affect them personally. If there is a problem with the animals, I haven't heard nothin'. Even if there were guidelines I wouldn't trust them. The government has been trying to deny our traditional hunting and fishing rights, so I'd think this is one way to scare us out of doing what we have a birthright to do. It's not the chemicals preventing me from huntin' but the long arm of the White man's law.

Community Effects of Contamination Concerns

The discourses of participants provided several examples of how 'real' and 'perceived' risks of contamination have affected the attitudes and behaviours of community members. Several people reported that they no longer drink the tap water on account of it "not being safe because of all the chemical spills." Many rely on alternative water sources, despite lingering doubts about the quality and safety of bottled water. One elder in her 60s discussed how fears of toxic exposure had led her to decrease her consumption of local foods:

We did eat more traditional food when we were younger, but we still do eat most of the traditional food. Actually all the traditional food that we did we ate when we were younger but we don't eat them as much. The reason for this was that there was a study done here on Walpole a few years back. When the results came out, in my system there was the elements of pollution, or whatever, in my system. And when they tested my son, his was double what mine was. I think probably because what I had in my system was transferred to him when he was a baby. Then as he grew up we were eating all this traditional food and all the chemicals and stuff that were in the food that transferred into his body.

One young male in his mid-20s participant talked about the "no-win" situation of eating local foods. His comments resonate with the "choiceless choice" theme expressed by new mothers in the bottled water debate:

On the one hand, the scientists come out with reports saying that there are high levels of mercury in our local fish, and that we should be careful not to eat too

much, although they've never really specified what they mean by "eating a lot" and "safe levels." On the other hand, they've now come out saying that people should be increasing their intake of fish because they're the best source for Omega 3 acids that are necessary for brain development. They say that pregnant women should be getting these nutrients and also growing children. But these are the same segments of the population that are most vulnerable for mercury poisoning. They talk about cost-benefit analysis. Well, if it was up to me, I'd rather have less brain cells and live rather than take the risk and eat fish and get poisoned and end up brain damaged or dead.

Other participants said that they were sometimes wary of collecting and eating local plants because of fears of contamination. One woman noted that she used to always boil dandelion plants because they say it cleanses the system and prevents cancers, but now the fear of chemicals in the groundwater have made her avoid eating local food because she believes they will jeopardize her health.

An administrator in his 60s discussed the different "weighing of risk" he's observed in the community, and how this has led to polarized views and antithetical positions and behaviours, with respect to environmental health issues:

I see that some people in the community avoid the water and eat the fish, while others avoid the fish and drink the water. I'm on the side that thinks that eating the fish is more of a risk, because of bioaccumulation. The polarization of the issue is apparent in people's behaviours. Some people continue doing what they do, saying that if it hasn't killed me in the past, it won't kill me now. Another variation is a fatalist approach: "If it's gonna happen, it's gonna happen" attitude. On the other end of the spectrum, you have those alarmists who if they wake up and stub their toe in the morning blame it on the water. We do not want the extremes. We want a balanced approach. We want to educate people about the risks and have them make reasonable and responsible choices. But we can't do that until we have a solid evidence base for contaminant levels in fish and wildlife and also, we need to be able to prove some association or link between pollutants and the health conditions in our community.

Other changes in lifestyle and behaviour include self-imposed prohibitions, such as avoiding to swim in local bodies of water and prohibiting their children from engaging in this form of recreational activity. As one male elder in his late 60s noted:

I haven't gone swimming in the water for over 30 years because there's just too many people getting sick, like the bacterial culture, something like that,

coming down in the river. People would be getting lesions, whatever you call it, sores on their bodies from swimming. So I says, “no I ain’t swimming in that no more.”

A mother in her 30s talked about her mother’s unsuccessful attempt at prohibiting her and her brothers from swimming in the river:

When I was really young, we swam all the time. In the river by the old ferry dock, up at Highbanks, in the Snye. My family also owned a small lot, like an island, with a cabin and we’d spend all our summer there. Then, when we got a bit older, like maybe 12 or 13, my mom told us it wasn’t safe to swim in there no more. I think she got scared from the major chemical spills at that time. But me and my brothers still went swimming. And one day she found out because we all got ear infections and she gave us hell. Now, being a mother myself, I can appreciate her concern. I take my babies who are under the age of three to the beach, but I don’t let them go in the water. I just let them play in a pool in our backyard. But I’m sad that they won’t get to experience the freedom we did, of being in nature and enjoying the island in that way.

Another elder in her 60s noted how parental fears have prevented children from learning to swim and enjoying life and nature:

They don’t let their children go swimming the way they used to. I remember as a young married person seeing young two year olds diving off of the breakwall into the St. Clair River. And you’d just see a little two-year old being able to swim and dive in like a little muskrat out there. Now women are holding their kids close. They’re not letting them do that.

The fear and stress experienced by WIFN residents during environmental crises permeated the narratives on water security. One female participant in her late 50s discussed two examples of water crises:

It’s always really stressful during a spill. I can remember when the blackout happened in the summer of 2003. It was hot, we had no electricity. They shut the water intake. People weren’t sure where to get the water they needed. And then it happened again in winter 2004. Again, that was accompanied by a power failure. There were people with no heat and lights in the middle of winter. We had to care for elders to make sure they were warm enough and had a warm meal. It was a real state of emergency in our community.

Another informant in his mid-40s remarked:

There are two kinds of stresses: The one is you're already concerned about what's in the water. It's like a ticking time bomb in the back of your brain. Then the second one comes when you hear about the spill, it kinda explodes and there's chaos and fear and you feel that you wanna do something but there's nothin' that you can do. I think that feeling of being helpless and hopeless, like, in your mind, is what gets you really down, really, sometimes, even more than the fear of what chemicals you've been exposed to.

The economic implications of living in an "area of environmental risk" was also a common discursive theme. Fishing and hunting are subsistence economies that provide a dependable, inexpensive food source. Pollution and other factors that threaten the integrity of local foods have a serious impact at the household level. As one fisher in his early 60s explained:

Poverty is a huge issue in most Native communities. Walpole is no exception. My family was very poor growing up. But we always had food on the table because my dad would go out and fish and hunt. Even today, I'd guess that almost every household relies on local foods to supplement their diet. There are people that just get by on things that they catch. If the fish are contaminated and sick and the population of animals aren't what they should be, that hits people hard.

A commonly cited statistic is that unemployment in the community rises by 70% during the transitional season (referring to the end of duck season in late-December and the beginning of the fishing season in early April). The peak fishing season is in Spring, although people do fish year round (including ice fishing). Duck hunting begins in the fall and continues until late December. The hunting of small game birds and animals occurs year round; the start of the season depends on the seasonal migratory patterns of specific species. Fears of toxic exposure can have a detrimental impact on the community's economy. As one hunter and guide in his late 40s explained:

People who work in recreational tourism make the most of their income during the duck hunting season and fishing seasons. Our clients range from regional residents, to US citizens and even international visitors. Most of these people hunt and fish for sport, meaning that they don't necessarily eat what they hunt. But,

being labeled as a “contaminated community” can of course negatively affect our public image as a recreational tourist destination. We don’t necessarily have the solid scientific evidence that proves that there’s a problem, but like they say, a person’s perception is often their reality.

Another hunter in his early 70s situated the issue of pollution within a wider social and economic context:

If you ask anyone about the hunting and fishing, they will say that there’s been a decrease in this sector. I’d love to blame it all on pollution and that may well be a contributing factor. But it’s not that simple. I’ve hunted and fished for over forty years. In my opinion, the decrease in recreational hunting and fishing is due to more social and economic issues. For example, 9/11 brought stricter rules on carrying guns across the border. So, American hunters were getting hassled. When the Canadian dollar was strong and at par with the US greenback, fewer Americans came over because it wasn’t a bargain anymore. When the economy collapsed last year, people were staying home and saving money. The high price of gas also played a part. People aren’t using their pleasure boats or traveling across the bridge because they are saving up on gas. When the economy collapsed last year, again that affected the tourist industry. The new nuisance is the mandatory passport law, which is making it more difficult to cross the border. So, pollution is one part of a bigger puzzle, at least as I see it, in the last couple of years.

Historical Mercury Contamination of Lake St. Clair

Older fishermen talked about the economic and social consequences of historical environmental crises. High levels of mercury detected in Lake St. Clair fish and traced to spills from two of Sarnia’s Dow Chemical chlor-alkali plants in the 1970s resulted in a ban on commercial fishing in Lake St. Clair. The decade-long ban resulted in major loss of revenue for the Walpole Island community (Marchand 1986). Native fishermen received an extremely small compensation from the government and from Dow Chemical. Financial compensation was primarily in the form of interest-free loans from the provincial government under the Fisheries Loan Act (1970). Loans received by those with a commercial fishing license amounted to 70% of the “net fishery income less

income taxes” which the applicant might have expected on the basis of his 1969 operations. The final loan, received in 1973 was based on similar calculations but only went up to a maximum of fifty-percent of the second loan. The loans were ultimately forgiven in 1976 because it appeared unlikely that commercial fishing on Lake St. Clair would be re-opened. The commercial fishermen also received a sum of \$200,000 dollars (which they divided between themselves on the basis of pre-1970s catches). The money was the result of a lawsuit between Dow Chemical and the Province of Ontario, which became too costly to continue after a number of years (Marchand 1986:52).

When Lake St. Clair was re-opened for commercial fishing in the early 1980s, it was much reduced. Compared to the thirty-four commercial licenses that were issued before the ban, only ten commercial fishing licenses were issued in the early 1980s. The re-opening was accompanied by several changes. The Ontario Ministry of Natural Resources was put in charge of managing the fishery; quotas were allocated, and some species, including game fish were not included in the quota system; each licensed fisherman was obligated to use three fishing methods (trap nets, baited hooks and seine); each fishery was to be restricted to areas of the lake stipulated by OMR; zoning and fishing seasons were imposed to protect fish sanctuaries and spawning areas and to avoid physical conflict between commercial and sports fishermen (Marchand 1986:53-55). Selection criteria for commercial fishing license applicants were also introduced. As one fisher explained, “preference was given to former Native and non-Native licensed fishermen who had the experience and financial means to re-establish their fishing operation and fish the allocated quotas.”

Despite reassurances that Native fishermen who applied for licenses would be given priority, only one out of three WIFN fishermen who applied for a license in 1980 was successful. The two unsuccessful applicants appealed the decision to the Game and Fish Hearing Board of OMR in 1981, but were unsuccessful in reversing the decision (Marchand 1986:55-56). One fisher described the different ways that the 1970s ban affected the once viable Walpole Island fishery:

Well, most people who can remember the 1970s mercury fiasco believe that the contamination issue was used by the Government as a justification for revamping the existing commercial fishing system and to implement policies that catered to the more lucrative profit-making sports fishing industry. Several things resulted from the fishing ban: strict quotas and size restrictions were placed on fish. They set these because apparently certain fish posed a greater contamination risk, so there were strict rules on the numbers and types of fish you could catch. There was a huge amount of capital investment that was required due to the loss of markets during the ban.

Many fishermen continue to believe that the ban was later used by the Ontario Government as a policy instrument to remove commercial fishing permanently from the lake through the imposition of a strict management regime in the 1980s (Marchand 1986). The ban left WIFN fishermen feeling disillusioned and distrustful of the government, due to the lack of information and government-imposed restrictions (tight quota system) that favoured the sportfishing industry. As one fisher explained:

The ban was based on what the Government said it saw as wrong... nobody ever saw any scientific studies or proof of the state of the Lake. It was just assumed that we would take the Government's word- well, history has shown us how much that's worth. No, I think the people that lived through it think it was more a political issue, a way of denying Native people their traditional hunting and fishing rights... a case of the tail wagging the dog.

The discourses on water and food safety shed light on several issues. Fears of contamination have led many people to seek alternative water sources. However,

this strategy is considered a “choiceless choice” by many, because it is economically prohibitive, and because the lack of regulations for bottled water offers little reassurance to residents of the safety of the water that is purchased. Concern over environmental contaminants has also caused many residents to avoid eating local fish and wild game, although it continues to be an important form of subsistence for many families and is intimately tied to cultural identity.

People’s concerns over water pollution manifest as a constant fear of chemicals that lurks in the background of resident’s mind, and punctuated moments of anxiety and stress that occur during spill events. These concerns have become embodied in different ways: they have affected dietary patterns, recreational behaviour and peoples’ conceptualization of their own health. Because recreational tourism continues to be the WIFN community’s number one industry, the economic impacts of real and perceived pollution are considered a major threat to the community’s viability and economic survival.

The Communication of Environmental Risks

Chemical spills are a perennial problem for Walpole Island, and the communication of “environmental risks” was an important ‘micro-theme’ related to the theme of water security.

Under the current *Ontario-Michigan Joint Notification Plan*, responsible parties at the spill site are obligated to report spills and must contact local government officials. In Canada, a spiller must also contact the Ministry of Ontario Environment Spills Action Centre. Telephone calls are then made to appropriate local and state government agencies in both countries. In the U.S., the spiller is required to contact both the Michigan Department of Environmental Quality’s Pollution Emergency Assistance Service (MDEQ/ PEAS) and the nearest, most appropriate local government agency.

MDEQ/PEAS and local government agencies will confirm this contact (Friends of the St. Clair River 2009:3).

According to the St. Clair River Remedial Action Plan Notification Flow Chart, when spills occur in Ontario, the spiller is obligated to notify local government, fire and police departments, other local agencies, officials and/or hospitals and counterpart local Government in Michigan. Walpole Island has a contingency plan which delegates the duties of Band representatives in the spill notification process.

Spills Communication

Despite these existing systems, the narratives of WIFN participants revealed strong dissatisfaction with the way in which spills information was communicated. Many felt that spills notifications were not released in an expedient manner. As one female former administrator in her late 50s explained:

A textbook example of the failure of the spills reporting system was the Royal Polymers spill of July 2003. We didn't hear about the spill *until five days after the fact, when they said that we shouldn't use the water*. A useless warning, given the fact that we were using the water all that time, unbeknownst to us. They were fined for that spill, but that doesn't make any difference to us. Neither does it change the fact that we exposed ourselves and our children to those chemicals.

Another community member described some of the factors that challenge the expedient dissemination of spills information to the WIFN community:

Some people don't have phones, so usually flyers are printed up and delivered to households. This is sometimes challenging because some people don't have mailboxes either. We do have a radio station but that is not manned 24/7. We have elders who don't have transportation and need to be checked on. The community rallies together and does the best that it can with the existing infrastructure and resources that it has. So, it's a more involved process which also takes time, and time is something you don't have at your disposal during an emergency.

Several people expressed their anger at industry for its failure at being good corporate citizens. They also expressed their wariness of the “trust system” upon which the current model of industry monitoring is based:

The problem is that there’s no “neutral third party” monitoring industry to assess whether they are abiding by environmental policies and reporting spills in a timely manner. It’s basically based on the trust system. Industries monitoring their own behaviour. It’s the same issue as “whose policing the police?” A lot of people think and I’d agree with them, that not even half of what’s “accidentally spilled” is being reported.

Some participants expressed anger at the Government for failing to adequately enforce environmental protection policies. As one elder in his early 60s stated:

What’s a \$10,000 dollar fine to a big company? What’s a \$100,000 fine? It’s pocket change, peanuts. It’s much less than what they’d pay for properly disposing of the toxic stuff they dump into the river. It reminds me of a documentary I saw where the airline company knew that there was somethin’ wrong with their planes. They ended up getting their number crunchers in there, who said that it would be cheaper to pay off the insurance to people’s families in the event of a crash than it would be to do the repairs. Sure enough, the glitch was reported but nothin’ was done and a couple planes went down and people got killed. It’s the same thing with these chemical industries. That’s because the only thing that’s important to them is the bottom line.

A number of participants felt that the government “turns a blind eye” to environmental accidents because the government is in collusion with industry in the interest of turning a profit. As one man in his 40s noted:

Of course the government won’t punish industry. They’re in bed together. It’s like the right hand not knowing what the left hand is doing. If you think about all the billions of dollars tied up in the petroleum industry and the money it injects into the economy and into government pockets, it’s no surprise that the ‘punishment’ meted out for environmental disasters is a slap on the wrist.

Walpole Island residents also voiced their position on “legal discharges.” The call for “zero discharge” is at the core of the community’s environmental philosophy and activism. As one member of Akii Kwe stated:

Our community’s position is “zero discharge” into the river. Period. We don’t want to engage in dialogue on “tolerable levels of risk” firstly, because we

believe that any toxic emission into the river is a risk; second, we were never part of any decisions regarding the standards for risk; third, tolerable levels of risk are considered mute and void to us. Measurements based on controlled experiments of chemicals in isolation, without taking into consideration the interactions between the many chemicals in our river and what the cumulative effects are on our bodies, the bodies of our children and the unborn and the body of Mother Earth and her waters renders these estimations and projections useless, from our point of view.

Distrust of Information

Another common theme was distrust in the accuracy and quality of spills information. As one interviewee in her mid-40s noted:

I don't trust the information they share. I mean, how do we know that it's true? Plus, I notice a lot of inconsistency in the amounts and types of chemicals that are reported in the media. I tried to get information from the Spills Action Centre once, but it wasn't easy. They weren't forthcoming and they cited a lot of administrative reasons for not releasing the spill information I requested. This information should be public information and accessible to everyone, 24/7.

An employee at the Heritage Centre raised similar concerns about the quality and accuracy of spills records:

They'd call in the spill and we'd document it in a binder. But we never got an official documentation of the spills. To my knowledge, no one's ever cross-checked this information to verify the consistency and accuracy of the information phoned in to us and the information that's on file at the Ministry/Spills Action Centre. When I've asked them to send me a record of spills for a given year, they send me a summary of the spills, but I'd like a document with all the spills. I don't want them to decide what's important and what's not important. That's up to us to decide.

Several participants commented on the need for more autonomy and the need to exercise more agency in the spills monitoring and reporting process. Several people identified the need for a community-based, community-controlled water monitoring system. As one participant in his early 40s explained:

As things stand, we're dependent on a system that has failed us in the past, and that hasn't proven to be reliable. The only thing that can give us some peace is if our community had its own water monitoring system, so that we can train our own people, read the data and take the appropriate actions when necessary.

These systems have been used in cities across the river (US) effectively. Our First Nation is capable of doing this. We had an air monitoring station in the community for years. Until the spills stop completely, this is the only way we can be actively involved in protecting the interests of our citizens and the health of our environment and our people.

The need for local risk communication strategies was tied into the broader theme of environmental information. In general, community members drew on a number of sources for information on environmental issues. Although many people relied on public media sources (television, newspapers), they noted that the best medium for communicating crisis events is the local media and by word-of-mouth. As one woman in her late 50s explained:

People hear all sorts of things on the t.v. and radio. The science lingo is hard to understand, and I think it needs to be boiled down for regular people to be able to understand. There's also a lot out there that isn't necessarily true, and you need to have something in place where you can separate the wheat from the chaff. I think the Heritage Centre does a good job of that. They bring things to the attention of the community in a form that we can understand. They make it relevant to our own lives, which is the only way you can get people to pay attention to some of these things. I think they're pretty good at sticking to the motto: "think globally act locally."

In summary, narratives on risk communication have revealed that the majority of WIFN residents interviewed were unhappy with the quality of spills information provided and the mechanisms through which this information is disseminated. Many residents believe the information is not released in an expedient manner and that the data provided is unreliable, because it is collected by industry itself.

Residents discussed some of the logistical issues that impede the communication of spills at the community level. They also revealed that although they obtain environmental health information from a variety of sources, they consider the local dissemination of data, via community media, the information interface of the Heritage Centre and word of mouth as the most effective means for "getting the word out." Many people felt that the installation of a community water monitoring system would

provide more reliable, real time information that in turn, would provide some peace of mind to community members who in general, do not trust the information provided by industry, the media or the government.

Walpole Island First Nation Environmental Principles and Practices

The fourth core theme addresses the community's principles and practices. The *WIFN Philosophy and Principle Statement* (Nin Da Waab Jig 2002:2) conveys the community's founding tenets for social and environmental praxis. This document provides an important window to the cultural worldview that forms the basis for individual and collective action:

We, the First Nations of Walpole Island Indian Territory have inhabited these lands since the beginning of time. With this occupation we have developed our own language, heritage and values...in accordance with the Creator, mankind and nature. Through this relationship we possess the rights and freedom to determine our own path. We shall carry on these responsibilities as handed down to us by our Creator, our elders, and ensure that future generations shall be entrusted with these sacred obligations.

The community's *Environmental Philosophy Statement* (Nin Da Waab Jig 2002: 2) delineates a culturally based 'blueprint' for human interaction with the land and other living beings, while setting out the environmental values and responsibilities of the the Anishinaabeg at Bkejwanong:

To preserve, enhance, and maintain a mutual respect and to continue our beneficial dependency upon the environment, we shall endeavour to co-exist with Mother Nature and protect this relationship.

We, the Walpole Island First Nation People, pledge to use these resources to the mutual benefit of all people. We shall, therefore, ensure proper respect for all resources. As our elders have done we shall maintain laws that preserve our wildlife, lands and resources.

These principles outline a community specific cultural code that is deeply embedded in the discourses of WIFN residents. As one Heritage Centre researcher explained:

In our environmental philosophy, we state that we will continue our beneficial dependence on the natural environment. This is shown in how we use the land for clothing, food and medicinal plants. You're supposed to take only what you need and give respect in the form of offerings. We also say that we have pledged to use resources for the benefit of all people and here at the Heritage Centre, we engage in educational awareness and we do this by inviting visitors to come out to the island, to take our ecological tours so they can see how we maintain and respect these resources. In addition to our tours, others are invited to come out and use our resources for hunting and fishing, which would be our number one industry. Also because of our natural environment, Walpole Island is habitat for numerous species that are at risk and we would like others to benefit by having these species populate areas outside of Walpole Island. We will do this by protecting the species we have and later expand our work by re-introducing the plant and animal populations to places where they have disappeared.

The Relationship Between Environmental Stewardship and Self-Determination

Dean Jacobs, Director of the WIFN Heritage Centre, described the evolution of the research program from one that focused exclusively on land claims, to its current integrative research mandate:

I got a job working for the First Nation in April, 1973 as land claims research for WIFN. Back then, the First Nations was associated with the Association for Iroquoian and Allied Indians (AIAI) that was the provincial territory organization that secured funding for land claims research and created programs for their member First Nations. Each First Nation set up a community-based research unit for the purpose of researching specific claims, aimed at the resolution of those specific claims and grievances. The program was designed as one that was community driven. We've been able at WIFN to continue that principle of community based research ever since, and it's evolved into wider range of research and not just land claims.

From 1973 to 2004, the Heritage Centre research mandate expanded from specific claims research to treaty rights research and advocacy. In the 1980s, the research took another turn, building capacity for the First Nation to look at environmental research and resource management issues. Today, the work has expanded to include natural heritage protection; however, work on land claims resolution, rights protection and advocacy continue to be ongoing.

The WIFN community has used innovative ways to assert Aboriginal rights and to protect the lands and waters of their traditional territory. Since litigation and mediation in the sphere of environmental protection have their pitfalls, the community has pioneered alternative ways to protect the land and water from the effects of pollution. In 1985, WIFN signed a framework agreement with the Government of Ontario and the Canadian Government to discuss the three-way management of the environment. This was a major step in Native joint management of resources, as it represented the first time that the government entered into talks with an Indian Band on a government-to-government level (Jacobs, personal communication). The Federal Minister of Affairs, the Ontario Attorney General, the Provincial Minister Responsible for Native Affairs and the Walpole Island Band Council were placed in the position to define the scope of the Agreement and the extent of the involvement of the respective parties thereto. The focus on the Agreement would be on environmental protection and would cover areas from enforcement to ownership of resources. Geographically, the Agreement would cover 200 square miles of lands under waters and lands above waters. The whole issue of Native involvement in the protection of reserve environment and surrounding lands and waters arose through the WIFN Band's assertion to unextinguished Aboriginal title to the area. The negotiations were to be without prejudice to Constitutional, Aboriginal or Treaty rights as the Band did not wish to use the discussions to circumvent those rights. As Dean Jacobs explained:

Walpole Island was never set apart as a reserve. WIFN has no boundaries we have pure jurisdiction. The question was where does our exclusive authority begin. On WIFN, there's responsibility to have revenue to protect the community. The question is, how far does this bylaw extend into Lake St. Clair even though we have no boundary lines? We needed to get together to negotiate the Boundary Agreement. In 1985, we signed a Framework Agreement that started a long negotiation of the agreement. Three governments were authorized to govern and designate the reserve boundaries. This would clarify sovereignty, powers and jurisdiction. We were either negotiating a modern day treaty or sovereignty. It took ten years just to work on the framework. We hired a Bay Street Law firm, which began putting together a statement of claim for us. It was time to go to

court a month after the *Dalgamuk* decision-the first case where there's such a thing as Aboriginal title. We refined our statement of claim and in 1999 gave notice to Canada and Ontario that we're going to court. In 2000 we filed it and nine years later we're still not at trial. We launched it as a civil action that puts Canada and Ontario as the defendants.

He goes on to explain how the First Nation used its cultural responsibility as 'good stewards of the earth' to secure funding to support the legal actions surrounding the statement of claim:

This claim is self-funded. We went to a funding agency in the U.S. and started talking about Great Lakes health and litigation. We framed it as an excellent opportunity to support an environmental justice action. Our claim was that if we won the case, we'd become the owners of this land. Because of our track record, the funding agency saw us as a leader and champion of Great Lakes environmental health. The argument was that if we raised our level as owners, we'd have a higher profile to protect the Great Lakes. They provided us with a small grant and told us to go and hire the best legal advisor in Canada to see how successful we can be. We ended up hiring the former Attorney General of Ontario.

The lawsuit is still ongoing, as the typical duration of these kinds of court cases in Canada is 20 years. The greatest implication of the long wait is the loss of elders who are providing expert testimony, and also the loss of the original judges who are familiar with the case.

The delegation of environmental stewardship and management is a contested political issue that materializes in different ways. Dean Jacobs provided an example of the Federal Species at Risk Legislation and the WIFN's fight to tailor and localize management practices to better suit community needs:

Five years ago, the Species at Risk Legislation was enacted. The community started to get to know the Act last year. We knew that we had significant plant species and endangered species that were absent in other areas of the country. Because we've lived on the land with the species, and practice responsible stewardship, we have a close connection and understanding to our ecosystems. But now after 1,000 years, the protectors of the Federal legislation are telling us how we need to protect our land. We now need to protect ourselves from the protectors. At WIFN our list of species at risk grows daily. There are 60 species recorded in the federal species at risk and six of these species not found anywhere

else in Canada. When the Federal Government comes here it takes them at least two years to do a recovery, so these 60 species will therefore take a long time. Instead, we identified five ecological units: coastal waterways, wetlands, tallgrass prairies, oak savannahs and Carolinian forests. We want to do five recovery strategies (as per ecological area) and not a recovery strategy for each individual species. The SAR legislation and our response was a very contentious issue. It could have been our “Caledonia Protest.”

The community also put up a fight against the Federal strategy for dealing with an Emerald Ash Borer infestation:

Another contentious issue came with the Emerald Ash Borer infestation. The Federal Government drew a line from Tilbury to Lake Erie and quarantined the area. In Windsor and Essex, they went to cut down the ash trees. This was their attempt to control the problem. We were opposed to this. We wouldn't kill trees to correct the problem. I made a formal announcement regarding the Ash Borer, and said to the Feds that you aren't going to come here and cut down our trees. This led to a racialized debate. The non-Natives in the area said, “you made us cut down our trees, so why don't the Natives cut down their trees?” At the end, we won out and the crisis took its course. We use this example as a tool to debunk the ‘official discourse’ and myths of those in power.

Akii Kwe: Women Advocating for the Water and the Earth

In addition to the Heritage Centre, Akii Kwe: The Women of Bkejwanong, is another group that adheres to the community's environmental principles and has taken a lead role in environmental advocacy and education. The women adhere to a gendered division of social and environmental responsibilities, as set forth by ‘traditional’ Anishinaabeg cultural teachings. As one Akii Kwe member explained:

Indigenous people, worldwide, have teachings instructing us in the stewardship of the Earth and these teachings tell us that the Creator has provided a balance between male and female, each with our own role. We are here to carry out our roles as Women and Native people- we have been honoured with these two responsibilities, which we take very seriously.

According to the Anishinaabe worldview, women are the “keepers of the water” because they share many things in common with the Earth Mother, such as possessing great spiritual power and the ability to give life. Water is viewed as the lifeblood that nourishes and sustains Mother Earth. Because of its power, water is considered sacred and must be

kept pure. As one member noted:

In many World Religions, when people are baptized with holy water, they are welcomed into the faith. Our teachings say these waters must be kept absolutely pure because these river waters are our Holy Water. By taking even the minutest chance of contaminating it, you are desecrating all that is Sacred to us.

The women also share a great connection with the earth as it is the female aspect of the Great Spirit. The group's name Akii Kwe means "earth woman" in Ojibwe and reflects this connection. An important part of the transition from girl to womanhood is learning the teachings of female responsibilities and role in social life. Metaphors from nature, such as the strawberry teachings and berry fast are used within a spiritual and ritual context to convey these important life lessons to young Anishinaabe women.

Spirituality is central to First Peoples, and lies at the heart of Akii Kwe's work. The women perform many ceremonies and rituals as part of their gendered responsibilities for the earth and water. They use the sacred water in their Purification Lodge, in ceremonies of healing, rites of passage, naming ceremonies and especially in women's ceremonies. At these times, the teachings are spoken to the water and then it is passed around from one to another in the circle to be shared. At the changing of the seasons, a pilgrimage to the water is carried out in order to honour the Spirit of the water. There is a powerful understanding that the sacred and powerful water can both give life, and take it away. One woman provided an example of how the group was called upon to bless an area during the construction of WIFN's new water treatment plant:

When they were working on the water treatment plant, there were times that things would go wrong. There was negative energy. Some of the guys working there contacted us and we went to the area and smudged and prayed. The difficulties were overcome and did not return.

Another woman's story illustrates the women's faith in the transformative power of prayer and the strong ties women maintain with the female aspects of nature:

There was one time in particular that we felt that the water was sick from the pollution...that she was calling out to us for help. We went to a spot and made a circle. The circle was open on both ends, and one of the women at the end had her hand outstretched toward the water. As time passed, we saw that she was moving slowly toward the water. It was like she was in a trance. When we pulled her closer to the shore, she told us that she could feel the spirit of the water. It was sick and felt dead and very sad. She said that it was pulling her into the water. It was a very powerful moment.

The spiritual aspect of Akii Kwe's work is complemented by very pragmatic efforts to protect the earth and water for seven generations. The group has a representative who serves as the group's cultural liaison. She travels to different parts of the world to get up to date information on environmental issues, especially those that affect the water. The women feel strongly about keeping tabs on the international actions of local companies. As one woman explained:

It's not about only watching industry here like a hawk, but you also need to know that they are branch subsidiaries of larger corporations. You need to follow the trail of money to see where it leads, what mistakes they've made and covered up. In short, you need to always keep the big picture in sight.

The women identify the root cause for environmental disaster as the divergent value systems of Western and Anishinaabeg peoples. As one woman astutely noted:

Everyone talks about the problem of environmental pollution but never talk about the source of the real problem- greed. One time we gave a presentation to discuss the fact that water was going to be a rare resource. We heard that immediately after, someone from the audience called up his broker to buy shares in bottled water. We were lamenting the destruction of the earth and her waters and he was thinking of making a profit. He totally missed our point, but this was a clear example of the different value system held by the Native world compared to Western people.

Akii Kwe also takes Walpole Island's message and teachings to other parts of the world. The women have traveled abroad, met with foreign dignitaries and have made powerful presentations to Washington and the United Nations. A vital part of the group's work has focused on increasing environmental awareness through education and mobilizing political activism at the community, regional, national and international A powerful

testament to their philosophy and praxis is the position paper, *Minobimaatisiwin: We Are To Care For Her*, where the women demand more corporate responsibility and reach out to all women, of all faiths and cultures of the world to ask for their understanding and support, prayers and strength in finding a “peaceful resolution to contemporary environmental issues.”

The nuanced narratives of Heritage Centre researchers and the women of Akii Kwe clearly illustrate the interconnection of self-government, sovereignty, Anishinaabeg values and environmental issues and how the success of community activism is based on its strong mobilization of legal, political and cultural mechanisms for asserting autonomy and protecting its rare ecosystems from environmental damage.

Summary: The “Thin Description” of Generic and Nuanced Narratives

Gerald Ryle and Clifford Geertz use the term “thin description” to describe the surface observation and explanation of phenomena.⁴⁶ At the level of thin description, the Walpole Island toxic talk provides technical details of cumulative changes to the environment, witnessed collectively by residents. The nuanced narratives clarify the range of variables (age, gender, occupation, spirituality) that shape and inform different standpoints and contribute to the diversity of ‘situated’ traditional ecological knowledges. The narratives provide important information on the cultural and psychosocial underpinnings that structure “emic” understandings of risk and different modalities for

⁴⁶ “Thin description” is a superficial account that does not explore the underlying meanings of cultural members. Every ethnography description requires translation: therefore whatever the ethnographer relates cannot truly be considered thin description. However, this concept is used as a heuristic device to distinguish explanations that are surface observations as opposed to “thick descriptions” that involves understanding and absorbing the context of the situation or behavior and ascribing present and future intentionality to the behavior (Ryle 1949; 1971).

risk communication and crisis responses.

The “raw” ethnographic data demonstrates the existence of diverse Indigenous knowledges that are held by different knowledge keepers. Traditional ecological knowledge is based on observation and long-term interaction with the land, and is transmitted through experiential learning and cultural teachings passed down through oral tradition. The nuanced discourses of the interpretive sub-communities function as a form of triangulation; the juxtaposition of multiple standpoints and lines of evidence strengthens the validity and reliability of the qualitative data of environmental change. Taken together, the discourses form a qualitative baseline for gauging cumulative patterns of environmental change and demonstrate resident’s active engagement in schematizing a “lay epidemiology” of community health.

Moreover, residents were able to provide explicit examples of the ways in which sociopolitical and economic factors have compromised community health. There is consensus among community members that there is a progressive degeneration of health. Their human health narratives reveal collectively shared proxies for human health. These include: the prevalence and frequency of chronic diseases (cancers, diabetes, cardiovascular diseases) and autoimmune diseases (allergies, asthma, arthritis) that were “uncommon in the past”; rising rates of mortality and morbidity, decreasing longevity; and the appearance of rare diseases among the young and those who are otherwise healthy and practice good health behaviour. The nuanced narratives of new and expectant mothers and Akii Kwe members revealed that these groups identify children’s health and women’s health as proxies for environmental illness. Meanwhile, the narratives of Heritage Centre researchers reveal the Centre’s use of both TEK and scientific data as “yard sticks” for measuring ecosystem health and environmental degradation. Many community members demonstrated the application of a form of hazard mapping which was based on genetic and geographical factors to assess the differential distribution

of disease. Participants noted observed peaks in “community epidemics” from various diseases. Furthermore, community members identified a number of factors that they believe have contributed to disease etiology. These included various sources (industrial, agricultural) and forms (air, water soil contamination) of pollution. Some residents noted the syndemic effects of anthropogenic changes. They also re-framed alcohol, drugs and tobacco as “social pollutants”, indexing that these substances or chemicals are just as dangerous and as industrial pollutants. Aside from pollution, community members identified other factors that are perceived as having negatively affected community health. Participants identified changes to diet and activity levels that have arisen from certain politicized historical contingencies, such as residential schooling, the congregation of populations on reserves, transition to a sedentary lifestyle, diminishing traditional subsistence economies and socioeconomic indicators such as poverty and breakdown of the family unit.

The generic narratives coalesced to form an aggregate of cumulative traditional ecological knowledges that represented a community-derived “life science inventory” of plant and animal biodiversity and overall ecosystem health. This database was enriched by the nuanced narratives of hunters and fishers and elders, who provided explicit examples of species variation. Proxies for changes in animal populations included decreasing biodiversity, diminishing populations of specific species (frogs, ducks and muskrat) and changes to the physiology and health of fish populations. Participants provided specific examples of proxies used for gauging changes in the plant population. These included: decreasing biodiversity shortened growing seasons, physiological changes to plants and the diminishing availability of medicinal plants. Another widely discussed indicator of environmental change was the introduction of invasive plant and animal species. Phragmites, purple loosestrife and zebra mussels were examples that were provided by participants.

The generic narratives also revealed cumulative changes to Walpole Island ecosystems and the land and water. Almost everyone who was interviewed discussed observable changes to water quality (in terms of clarity, smell, taste and even feel) and the integrity of local fish and game (gauged according to appearance, taste and availability of species). Fishers and hunters reported decreasing water levels and shoreline erosion. Pollution, changing land use patterns, lack of planning (overdevelopment) overharvesting, invasive species and the degradation of the Anishinaabeg culture and erosion of the traditional value system were cited as causes of changes to Walpole Island lands and waters and flora and fauna.

Generic narratives on the communication of risk revealed that the expedient announcement of spills at both regional and community level is impeded by communication breakdown. Skepticism over the self-monitoring practices of industry and the failure of government to effectively enforce environmental laws have created an environment of distrust. This, in turn, has exacerbated resident fears and led to major lifestyle changes which for many residents, have included the cessation of recreational usage of local waterways, a decline in the consumption of local fish and wildlife and an aversion to drinking the local water, all due to fears of contamination.

The community's environmental principles and values reflect the culturally defined definitions of risk and stewardship. Walpole Island's position of "zero discharge" and Species at Risk Recovery program reveals the community's efforts to tailor federal and provincial environmental legislation so that they conform to culturally-prescribed standards. They also reveal the mutually-imbricated histories of the WIFN community's struggle for Indigenous sovereignty and self-determination and environmental justice efforts. The advocacy efforts of the women's environmental group, Akii Kwe reveals conformance to gendered environmental responsibilities which in turn, indexes the revitalization of cultural teachings and traditions among some sectors of the community.

CHAPTER FIVE

The Thick Description of Walpole Island Toxic Talk

Chapter Overview

In this chapter, I conduct an archaeology of risk narratives by analyzing the stratigraphy of Walpole Island residents' toxic talk. I engage in "thick description" by examining the implicit meanings embedded in participant's narratives. This is done for the purpose of determining what more the discourses can 'yield' about community environmental problems, health concerns and the processes by which the Walpole Island interpretive community as whole engages in knowledge production, meaning making and resistance, in the context of environmental advocacy and activism.

Examination of a specific genre of discourses that I refer to as "elegies and echoes of loss" reveals parallels between discourses of environmental degradation and past experiences of historical trauma (residential school experience). These narratives index the overarching theme of structural violence. Many WIFN residents view environmental destruction as a direct by-product of colonial expansion and cultural genocide. This historicized, and context-rich interpretation expands the conventional Western definition of "environment" as physical, so that it also includes the social environment. Elegies of loss illuminate the importance of considering the effects of colonization and assimilation policies and how these contingencies continue to influence the conceptualization of external threats and stress responses.

Historical, political and social crises serve as community frames of reference for risk analysis and inform contemporary responses to environmental threats. I discuss the psychosocial legacy of traumatic events as a substrata for contemporary stress events, and how ecological crises amplify levels of community stress (especially among elders) by serving as mnemonic triggers of past injustices and traumas. Historical, political and

social crises serve as shared community frames of reference for risk analysis and inform contemporary responses to environmental threats.

A second genre identified through the thick description of an impending environmental crisis was a “discourse of resistance” that is used as a vehicle for community environmental activism. Moreover, these discourses perform an important epistemological turn: they recast the study group from object to subject by discursively moving the reader from the narratives of elegies of loss that frame Native peoples as “passive victims” of systematic oppression, to the more active and empowering position of survival and resistance or what Gerald Vizenor calls “survivance” (1998; 2009) the ultimate exemplification of survival, endurance and resistance.

Distinguishing the Different Layers of Risk Discourses

To this point I have focused on thin description, that is, how environmental health concerns and the various dimensions of these concerns are expressed through community environmental discourses or toxic talk, and how these narratives provide a window to how environmental threats are envisioned, understood, and acted upon by different Walpole Island subgroups. Given the embeddedness of culture in language, the next question to ask might be: “What can these narratives reveal beyond purely descriptive details about specific environmental themes and issues?” In other words, what can the discourses tell us about the very philosophical structures of Anishinaabeg society, and how these constructs inform and influence the relationships people have with other living beings and the earth itself?

Where thin description is content-focused, thick description is context-oriented. Denzin (1989:83) provides an insightful definition of thick description as an ethnographic

research methodology:

A thick description ... does more than record what a person is doing. It goes beyond mere fact and surface appearances. It presents detail, context, emotion, and the webs of social relationships that join persons to one another. Thick description evokes emotionality and self-feelings. It inserts history into experience. It establishes the significance of an experience, or the sequence of events, for the person or persons in question. In thick description, the voices, feelings, actions, and meanings of interacting individuals are heard.

Thick description views data as a hierarchy of meaningful structures. The goal of the ethnographer is to pick her way through the piled up structures of inferences and implications made explicit through human thoughts and behaviours. Through thick description, the interpretive matrix is expanded to focus on the context of practices and discourses within a society.

I have indicated the importance of situated knowledges, standpoint theory and context to understanding the experiences of those living in the shadow of looming ecological crises. The Walpole Island discourses reveal multiple perspectives on a wide range of environmental issues. However, the discourses themselves are multi-layered. Like a palimpsest, each level of analysis reveals different strata of meanings that constitute the construct of “environmental threats”, as they are interpreted by different community members.

Elegies and Echoes of Loss

Beyond providing detailed information on cumulative changes in ecosystem health, elders’ narratives presented a genre of discourses that I identify as “elegies of loss.” In the literary tradition, an elegy refers to a poetic genre that is an expression of grief for the loss of a person. In *Triste Tropiques* (1955), Claude Lévi Strauss uses this type of literary

form to express what he observes has “been lost” due to modernization and globalization. Elegy is a fitting descriptor of the elders’ stories because they are infused with sentiments of grief and melancholy resulting from a multitude of interrelated losses. The trauma from these losses is unreconciled because the sequelae that have formed the etiology of trauma have not been addressed or resolved by the traumatized individual. Because a fundamental part of trauma is the decimation of identity, reconciliation requires a dedication to identity restoration. The loss narratives reflect the overarching themes of inequities and injustices experienced by Indigenous peoples in general, and by WIFN elders in particular within their lifetime.

Narratives of loss are unique because of their centrality and specificity in the discursive context of elders. However, traces of loss are present in the generic narratives of all participants in the form of “echo narratives” the resonances and ripple effects of discourses of loss that appear in the narratives of successive generations. In this way, the loss narratives act like bridging narratives, because they connect the specialized knowledges and embodiments of specific losses experienced by certain segments of the population (elders), with the generic narratives of loss of those who have acquired knowledge of these losses anecdotally through “second or third hand experience” via the cultural history passed on through oral tradition. A number of losses were conveyed by the elders, however I am presenting the most commonly shared topics that reached a level of theoretical saturation due to their sheer repetition in the discursive sphere of interaction.

Loss of Land

At community meetings and presentations, reference is always made to The Royal Proclamation of 1763, which in effect was an Imperial declaration or promise which stated:

Under our Protection [Indigenous people], should not be molested or disturbed in the Possession of such Parts of our Dominions and Territories as, having not been ceded or purchased by Us, are reserved to them, or any of them, as their Hunting Grounds.

The Royal Proclamation of 1763 affirmed Native land, hunting and harvesting rights, and recognized Aboriginal Tribes as Nations. When asked about environmental problems, many elders reframed the issue of “chemicals” and environmental change within the broader historical and political contexts of Native and non-Native relations and processes of colonization. Many elders took the chance to re-assert Aboriginal peoples’ presence on Turtle Island “since time immemorial.” As one elder in his late 60s commented:

We are Anishiannabeg. That means the First People. Our origin and place in this world is in our Creation story, in our teachings, in our language and in our culture. Our people did not come here chasing mastodons over the Bering Strait. We are not savages. We were put here by the Creator. We have been here since time immemorial. They say that Indian people believe in myths. Our Creation stories are based on truth. The version of Western history is a myth. When Columbus arrived on Turtle Island in 1492, these lands were not vacant. They were populated by Indigenous peoples. I’ve read estimates that indicate that in 1492 there were between 8 and 112.5 million people living in North and South America. Either of these estimates mean that there were actually more people living in North and South America than were living in Europe at that same time.

Speaking on the same theme, an elder in his late 50s noted:

Prior to European arrival and colonization, there were already many nations inhabiting this continent with very distinct societies, cultures, languages, beliefs, and governance structures. This fact becomes the basis for dealings between the Crown and Aboriginal Peoples on a Nation- to -Nation level.

Elders’ responses to direct questions about pollution were always tied back to a larger narrative of loss of Native lands, and the political, social and economic implications of this loss. As one elder in his 70s explained:

Before the arrival of White people, we had our own social system and living patterns. These were based on the seasons and the migration of animals. We were a hunting people. We would travel in small groups, usually groups of relatives and families would stay together. We’d follow the migration routes and live off the land. In the summer, we’d all congregate again. Walpole Island was known as a meeting place for a very long time. There we’d reconnect with

each other, share whatever we had, conduct our ceremonies and rituals, bury our dead. We had a real sense of community and solidarity and a connection to the social and the natural world. We knew our place and our role and fulfilled the Creator's plan. This has been lost. We no longer live off the land. We no longer have the freedom to move as we like. The White man's rules have prevented us from asserting our Aboriginal rights. Our children and great-grandchildren are suffering because they never learned how to live as Anishinaabeg. They do not eat, talk, live or feel like the Anishinaabeg. They have lost touch with their spirit-they are hollow.

Another elder in her early 60s talked about the Western creation of borders and boundaries:

Indian people don't draw lines in the sand. Neither do they put up fences to mark out their territory. The idea that someone can "own" land is not in our belief system. It is the Creator's and it is here to share among the four races (red, yellow, black and white) that he created. We did have a notion of being respectful when in other peoples' territory. Even today, if we got to hunt up north we ask for the First Nation's permission. But this is a give and take relationship. It's not that they own the land, but that that's where the Creator placed them to be, they are the people of that land and you need to respect that.

One elder in his late 60s talked about the Western world's inability to comprehend Native peoples' connection to the land:

When Justice Berger went to do his report for the Mackenzie Valley Pipeline, he found out that Native people have a deep and rich knowledge of the land. Where white people only see flat unmarked indistinct land, Native people have invisible mental maps of the world around them. They know every animal, every species' movement pattern, every ecosystem. Our knowledge is very tied to place. But white people don't know this or don't want to understand this. I remember hearing a story where they moved a whole Northern community. I don't remember if it was because of development or contamination. They moved them a couple hundred miles away, thinking, one place is as good as another. The white people who made the decision to move them only saw snow. Everything looked the same and was the same, to them. But this made a huge difference to the people. They didn't have the knowledge of the area. They weren't able to successfully hunt and the community really began to suffer. They had no knowledge of that place, that's why.

Another elder in his late 50s explained the importance of the land to the Anishinaabeg's physical, psychological and emotional well being:

The environment sustains us both physically and spiritually. Even today, it is important economically and without it we wouldn't be able to survive...we'd have nothing. Our natural environment has natural resources like wetlands, forests, prairies where we fish, hunt and harvest medicines. There are also places where we seek solitude and reflect. Where we can reconnect with our spiritual side. This is a fundamental aspect of who we are.

One elder in her late 70s elaborated on the spiritual connection to the land:

The land is sacred to us. It is full of spiritual entities and spiritual energy. There are sacred sites that provide us with a connection to the Creator and to the past and give our lives a roadmap for living the good life. The sites might be old burial places. These are sacred because it is where the bones of our ancestors lay. Other sites have certain stories attached to them. These stories serve as lessons for the past. Say, for example, there is a spot near the river that has a story of a young person who was doing something they weren't supposed to and they drowned. That spot becomes a living lesson for others. You take your child to that spot and tell them that lesson. They can carry that lesson and store it until the time comes when they consider doing something dangerous. The story will pop in their head and will hopefully change their behaviour. Just as we live off the land, we learn off the land: we learn how to honour and emulate our ancestors, how to be ethical, how to bring pride to our family and community; how to live in harmony with all the living things around us. These are lessons that you cannot get in the white man's schools or from the white man's books. This is our wisdom and our living knowledge.

Loss of land is understood in material terms (economic loss from appropriated land, inability to fully exercise hunting and fishing rights and practice traditional economies), symbolically (inability to be self sufficient and to practice traditional forms of governance and social organization) and spiritually (loss of connection to nature, sacred sites and the healing power that comes from the symbiotic human-nature relationship). Elders often resisted responding to questions exclusively about pollution; their responses were always situated and qualified within a broader story or moral theme. Elders effectively contextualized, historicized and politicized each of their answers to my questions. In a way, the elders' were discursively practicing their own form of thick description. From

their perspective, my questions about pollution were ‘thin’ and disembodied-they weren’t attached to a certain history or lived experience. Narrowly phrased, they did not accommodate a broader spectrum of experiences- they were not holistic. By speaking in this way, constantly re-framing and re-historicizing contemporary events, the elders resisted the narrow scientific and biomedical framing of a number of concepts: “environment” became problematic because it insinuated the physical environment as being divorced from human interaction, “perceived risk” in the scientific sense was understood as insinuating something “imaginary, or dwelling in one’s head, and “chemophobia” in the narrow biomedical sense of irrational fear represented a “Western” construction that spoke only about pollution and nothing else. The elders’ concerns were tied to very real historical events which dwelled not only in the past, but were seen as being repeated in a perpetual loop of social and political injustices. The elders’ discourses were strategically used to draw my attention to the broader range of issues at play and the contemporary relevance of history to understanding the kinds of stresses experienced by Native people.

Resonances With Residential School Discourses

Narratives describing ecological loss and destruction shared the themes of loss of identity and culture that were the direct result of government assimilation policies. The support for assimilation policies proliferated in Government Indian Policy. In one of his political speeches, John A. McDonald asserts that the goal of the government is

...to wean them [Native people] by slow degrees from their nomadic habits, which have almost become an instinct, and by slow degrees absorb them or settle them on the land. Meantime they must be fairly protected” (May 5, 1880).

Of all the mechanisms for assimilation, the institution of residential schools bore some of the most detrimental impacts on Native peoples. The schools were established in order to remove Native children from their communities for the sole purpose of assimilating them into the ways of the dominant white Euro-Canadian society. A plethora of studies have

shed light on this dark legacy in Canadian history, bringing into full view the various abuses endured and traumas still carried by residential school survivors (Fournier and Grey 1997; Furniss 1992; Kelm 1998; Milloy 1999).

When asked about environmental change, WIFN survivors brought the conversation back to the larger political context and expanded their response to include changes in the social environment by articulating how the effects of assimilation and the schools remain all too apparent today:

The residential school experience has influenced survivors in different ways. In general, they exhibit extreme difficulties with authority. This translates into a higher crime rate and overrepresentation in the Justice System. They are generally less educated and experience higher rates of unemployment and poverty. Survivors also suffer from higher rates of alcohol and drug abuse and suicide when compared to the general population. Because they were taken away so young and never witnessed or experienced loving and functional family dynamics, they lack parenting skills and are emotionally distant and detached.

In other words, the environment of the residential school is inseparably part of the Survivors' interpretive matrix of "environment" because it was a part of their history and thus, an important frame of reference for both past and contemporary processes and events. The evocation of alcohol and drugs (and their abuse as the result of this troubled history) in the survivors' responses to questions about pollution reaffirm the broader re-classification of alcohol and drugs within the category of pollution that is typically only assigned to industrial chemicals in biomedicine.

When asked to name the most detrimental sources of environmental change, one survivor in his mid-60s reflected on the loss of home place and belonging and the loss of cultural heritage:

You got back from residential school. You no longer knew your family. Didn't know your clans or family history. Didn't know your role or place. Didn't even know the island. A stranger in your own homeplace. A lot of kids went straight from residential school to the army and war, fighting in Korea and Vietnam. The generation after was the "scoop" generation that was taken off rez and adopted out. You got multiple generations with no sense of their roots or cultural heritage.

The disconnection from family, home and sense of ‘homelessness’ expressed by some survivors is the very issue talked about by Akii Kwe members who trace the roots of ecological destruction to the disconnection of the Anishinaabeg from the land. From this disconnection follows loss of land, culture and identity all which were precipitated and ‘made possible’ by the removal of children from their communities and acculturating them in residential schools.

There are striking parallels between the residential school narratives and the contaminants narratives. Both are defined by a commonality of experience and genre of testimony. The survivors’ discourses expressed high levels of similarity and consistency in experience and the embodiment of trauma (mental health issues, depression, drug and alcohol abuse). The same could be said for the reporting of environmental issues: the discrete witnessings of change, (although emerging from diverse groups and conveying very specific details) were extremely consistent in terms of the types of changes identified, time periods and perceived effects on community and ecosystem health.

Another similarity between the residential school discourses and environmental narratives was the description of the “burden of evidence”. In the residential class action lawsuits, the onus lies with the victims to prove that they attended the schools, during the specified time periods, and to provide testimony to support and validate their experience. The process of environmental remediation similarly interrogates the victim to prove the existence of environmental pathology. In the case of both residential school trauma and environmental trauma the “wounds” are invisible to the naked eye and difficult to prove according to the accepted standards of evidence. In residential school abuse, the legitimacy of the claim is based on third party others determining whether the chain of evidence is present. In environmental pathology, the determination of trauma or

illness falls within the hands of experts and scientists, who themselves concede the difficulty of definitively proving a one-to-one positive correlation between disease and chemical exposure. Both processes challenge the victims' oral testimonies and implicitly ask them to "show us your trauma", "prove your wounds of abuse", "prove that you got sick from the water." In both cases, the traumas are silently endured by those affected, who are left to hope that their experiences pass the test of validity, rigor and legitimacy set by the authorities of medicine and law, and that their symptoms "add up".

The processes of reconciliation and remediation are just as painful as the events themselves. I was present when the survivors viewed Prime Minister Stephen Harper's nationally televised Apology for Canada's Residential School Legacy in 2008. The event occurred during the same time as an environmental assessment for a local petrochemical company's proposed expansion. An elder in her early 70s, who attended a gathering to watch the Residential School Apology was also present at environmental assessment gathering. What is telling is that the elder voiced the same sentiments and employed the same genre of discourse at both occasions:

We were taken from our families like the land was taken from us. We were abused in those institutions like the earth's been abused. They used our bodies and our labour like the White man takes from resources of the earth. We lost connection to each other and the earth itself. Our wounds are still raw and we cannot heal. Like the earth cannot heal with the poisons she is drowned in.

Another theme that joins environmental concerns to residential school trauma is the issue of the stigma of labeling. A number of elders related that they disliked the terminology used to label the health experiences of residential school survivors. As one elder in her late 60s noted:

I take issue with the term post-traumatic stress disorder. It's not because I deny that there were traumatic effects related to residential school experiences. There are and I'm the first admit that. What bothers me is that the term points attention to the sufferers and not to the perpetrators. It says look, there are these people, and they went through some trauma and now they can't get over it and it's devastating their lives. Well, yes, that's true. But is this where we want to point the world's attention? We have our cultural mechanisms to deal with our pain. What we want the world to know and learn from is the "system" that allowed this to happen in the first place. The study should be of what is wrong or "pathological" about the system. The label for that is cultural genocide but what is the label for all the civil servants that allowed this to happen? In my opinion, you can keep your label to yourself. That's not the real issue.

Interestingly, the same kinds of sentiments emerged from discussions of environmental health labels and the environmental assessment process. An elder in her 70s articulated these feelings most clearly:

I don't like the word chemophobia. I find it offensive. It makes it sound like there's something wrong with you. I always thought phobia meant something that's in your head? Pollution's not in our head, it's all around us. I don't like how the finger is always pointed at the Native. Like industry does this often. They hold environmental assessments not because they want to but because they have to, by law. And they get together these meetings and tell us they want to hear our opinions and then they get defensive and tell us we're irrational and uneducated. Well, we're not the ones that should be studied: by industry or researchers. The people who should be studied and put under the microscope are those who are causing all the problems. Why doesn't anyone ever sit them down to ask them who gave them the right to destroy the earth and poison the water? They're the ones that are crazy.

Both residential school survivors and Walpole residents living with the fear of chemical exposure described a *political ecology of environments*. The residential school experiences were the loci of infectious diseases of tuberculosis and influenza that thrived in the dilapidated buildings of residential schools. Tales of sickness and death from these environments were often juxtaposed with stories of escape. As one elder in her late 60s commented:

There were several kids that ran away. I knew a lot of them lived off the animals they caught. We never felt at peace or as if we belonged locked up in those institutions. It wasn't until I returned to the island many years later that I recognized the real loss we experienced. Abuse, and sickness and hunger and loneliness aside, we lost out on being in our natural environment. We lost the joy of swimming in our rivers, of exploring our forests, of having that spiritual connection to the land we come from. There was a book I read, where an elder had told his story to a writer because he wanted to share his story. But then he burned the story because he needed to show the writer what he experienced. I think that that's the same thing as our experiences. We couldn't tell how our lives were altered, until we actually came back to our home community and saw what that difference was. It's hard to see it beneath the layers of troubles, but it's there. A life that is based on our values and traditions and living our way of life, in nature and with each other, as it was originally meant to be.

Many survivors equated toxic poisoning from environmental degradation with diseases of the past. As one elder eloquently put it:

Before it was TB and influenza killing us. Now it's pollution. Chemicals are the new smallpox blankets given to our people in the 21st century.

One elder in his mid 60s identified the sedentary lifestyle and life away from the bush as a source of illness for Native children:

We were sick cooped up in those buildings. We are 'Nishnaabes. We should have been out hunting with our fathers and uncles and learning things for our survival. Being in there- that place- that took away from the health of our bodies and the health of our spirits.

In a subtle but profound way, the survivor narratives and the issues they addressed provided an important *context* for research on environmental health risks: one which broadened the definition of environment and the sources and impacts of cumulative, multiple stressors brought about by converging forms of structural violence.

Loss of Sovereignty and Autonomy

When asked to speak about environmental pollution, the theme of the loss of autonomy also emerged as a common narrative theme. One elder discussed the degree to which

Native people were controlled and surveilled within their own community:

You couldn't leave the reserve without asking the Indian agent for permission. You'd need to tell him where you're going and why. It's like you'd sign out and sign in. Imagine what it felt like needing to ask permission to move around on your own land? It took away our dignity.

One elder in her late 60s talked about hearing stories from Native women who claimed that they were involuntarily sterilized by the government just because they were

Native. One elder notes:

I had a woman who was trying to trace her genealogy. Her mother had taken them to the States. She had denied that she was Indian to avoid being involuntarily sterilized. She's changed their names and dyed her kids' hair so they weren't recognized. Many Natives pretended they were Hispanic or other ethnic groups not to be singled out.

Several elders commented that community development did not get off the ground until the expulsion of the Indian agent in 1965:

The Indian Agent did nothing to promote community development. This was in line with the overarching Government plan to keep us in a continual state of dependency in order to 'keep us under thumb'. When our First Nation kicked the Indian agent out and took over responsibility for our own affairs, our community bloomed in several areas. In development, programs, infrastructure, etc. But before that time, there was very little advancement. We had no autonomy and were stuck in a state of stagnancy.

The community strives to break the cycle of dependency through the promotion of education and skills development, and cultural pride. Sovereignty is also a key issue in terms of self-determination and also environmental stewardship. As one elder in his mid 50s noted,

We can't be good stewards of the earth until our legal, cultural and spiritual relationship to land is acknowledged and respected. This can only happen when our sovereignty and Aboriginal title is recognized, until our land claims are settled, and until we are dealt with on a nation-to-nation basis.

There are strong connections between ecological stewardship, cultural identity and spirituality. Unfortunately, social and cultural variables that are not easily quantifiable

or that do not resonate with Western cultural values are considered inconsequential or superfluous in environmental assessments, which is often why Western scientists and academics fail to see the 'larger picture' of environmental impacts.

However, this important source of information is transmitted horizontally, among elders and members of their age cohort, and vertically to younger generations. The intergenerational transmission of knowledge is evident in the echoes of loss spoken by the children and grandchildren of elders. Although bearing no direct experience or memories of the previous generations' oppressive histories of residential school abuse, Indian Agents and blatant forms of racism, the emotional response to this history is no less powerful. The echo narrative shared by a young woman in her 20s was a clear example of this fact:

The government says that it doesn't acknowledge intergeneration trauma. I think that's BS. They know it's there- by all the alcoholics and drug addicts and broken homes and dysfunctional people. But if they acknowledge it, they'll have to pay restitution. Well, I don't think there's any dollar figure that can make that mess any better.

The comment resonates with the discourse of another participant in his 30s who voiced similar sentiments:

Our families and communities are hurting. Those that were in residential school and lived through all that trauma, they still carry it with them. My grandfather used to say that it is unhealthy to live with pain and sorrow, you carry it like a heavy sack on your back and it robs you of your energy and vitality. Everyone talks about how great this country is for personal freedoms and human rights. But you never learn our history, that of the Indian people in the school books. The worst part of the intergenerational effects is that no one talks about them. Parents never told their kids directly about what happened to them, those kids grew up many times in hostile and difficult environments because their parents were damaged and hurting. Those generations that came after them continued to experience the effects of this history but were never really given the reasons. The suffering has been going on for so long that people can't tell the difference between what is normal and what is dysfunctional. How can they, when they haven't been exposed to anything different than they've always known? There's no other point of reference to compare their life experiences to.

Structural Violence

Coined by Johan Galtung and by liberal theologians during the 1960s, the concept of structural violence describes social structures (economic, political, legal, religious and cultural) that impede individuals, groups, and societies from reaching their full potential (1969:57). Galtung's broad application of violence acknowledges the "avoidable impairment of fundamental human needs or the impairment of human life, which lowers the actual degree to which someone is able to meet their needs below that which would otherwise be possible" (1969:58).

Disparate access to health care, economic resources, education, political power, and legal standing are all forms of structural violence (Galtung 1969). Medical anthropologists have successfully used the concept of structural violence as a vehicle for navigating the political, economic and social underpinnings of poor health and human suffering. Physician/medical anthropologist Paul Farmer has used structural violence as an analytical tool for understanding the prominence and proliferation of certain diseases amongst the world's most impoverished and marginalized populations. His fieldwork in developing countries like Haiti and Rwanda has shed light on how diseases, such as tuberculosis and HIV/AIDS are linked to large-scale forces of racism, poverty, political violence and war (Farmer 1992; 1999; Farmer et al. 2006). At the institutional level, studies of structural violence have demonstrated how biomedicine itself has functioned as a domain within which structural inequalities are often perpetuated against the weakest and most vulnerable segments of society (Farmer 2003; Farmer *et al.* 2006).

Structural violence is an important framework for interpreting the elegies and echoes of loss. All informants agreed that one cannot heal others or the earth before

healing oneself from the effects of past traumas. They consistently emphasized that successfully addressing and mediating environmental problems depends largely on the restoration of traditional cultural practices. Renewing spiritual beliefs, revitalizing the Ojibwe language, and embracing and honouring one's Native heritage and identity are viewed as important prerequisites for re-connecting with nature and re-establishing the fundamental practices needed to restore and sustain the integrity of Walpole Island's lands and waters.

Environmental degradation, moreover, is viewed as a direct form of structural violence. Native scholar and environmental activist Winona LaDuke (1999) identifies *eco-violence* as another manifestation of colonization. From this perspective, environmental degradation (eco- trauma) is no different in scope or devastation than the historical traumas inflicted on Aboriginal peoples by the creation of the reserve system, the residential school system, and the loss of land and language that are the result of countless years of colonial oppression and assimilation policies (Stephens 2004; 2006). These imbricated histories are the common threads that weave together discourses of land, language, and self-government in Algonquian narratives (Darnell 2006; Darnell and Stephens 2007, 2007b; Stephens and Darnell 2008b).

The view expressed by WIFN elders is that environmental degradation is a form of "chemical genocide" just as the residential school system was a form of "cultural genocide." The elders' discourses also revealed that ecological crises can actually amplify community members' stress by serving as a mnemonic trigger of past injustices and traumas. This was most lucidly expressed in the testimony of one elder:

When I hear of a chemical spill, I am filled with mixed emotions. I'm filled with hurt for the earth that's being destroyed. But it also reminds me of all the things we've been through in our history. When the worry's there, it brings everything to the surface, the stress, the pain, the loss- the loss of our childhood, the loss of our culture and dignity, the loss of our land the loss of our youth to

drugs, and alcohol and violence. The memories rush back and my heart turns black, like the chemicals being dumped in the water.

Within the elder's interpretive matrix, the Western term "psychosocial stress" fails to capture the Anishinaabeg view of the interconnections of the physical and social environments, the linkages between historical trauma and contemporary forms of structural violence and the legacy of these embodied histories.

Discourses of Resistance

Beyond describing the content of the WIFN toxic talk narratives, it was equally important to examine the instances and contexts within which these discourses are deployed. This led me to ask the question: "In addition to 'talking the toxic talk' how did WIFN residents 'walk the toxic talk?'" In the section that follows, I draw on a contemporary example of community activism to illustrate how the WIFN community mobilized toxic talk to resist the Western propensity for framing environmental risk according to the "thin description" (exclusively pollution-focused discourses) by scientists and industry and instead, advanced the "thick description" of structural violence as an interpretive framework for discussing environmental impacts and community experience.

'Shell Shocked': The Proposed Shell Canada Refinery Expansion Project

In 2008, the Shell Canada refinery in Sarnia, Ontario submitted an application to expand their facilities. As per Canadian environmental legislation, the industry had a duty to consult with the WIFN First Nation regarding their development plans, as the refinery is located in traditional Bkejwanong territory. An environmental assessment process followed. Various stakeholders (representatives of Shell, the federal and provincial government and WIFN) assembled to assess the expansion's potential effects on air,

water and sediments. The environmental assessment process was precedent setting, because it was the first time that a First Nation had been invited to the table to participate as equals, in the decision-making process. Dr. Dean Jacobs assumed the role of community representative and the First Nation hired a consulting firm to conduct an independent assessment of the proposed expansion.

A Traditional Ecological Knowledge (TEK) Study spearheaded by the First Nation assessed possible impacts on WIFN natural resources (fish, wild game, plants and medicines) and cultural heritage (spiritually and historically significant sites) (see Lytwyn and Telford 2008). The Shell team fulfilled their “duty to consult” by conducting a series of community presentations and information sessions.

A defining moment of the assessment process was when the women’s environmental group, Akii Kwe was asked to organize one of the community meetings. Rather than replicate the Shell model of consultation (which consisted of posters and powerpoint presentations, and which was devoid of opportunities for a coordinated question and answer period) the women organized a feast and talking circle that was held in the gymnasium of the community’s elementary school. The gathering was a powerful event that clearly illustrated the ways in which the WIFN community deployed its unique brand of toxic talk. The meeting was structured according to Anishinaabeg protocol. The women began with an opening ceremony at which time they described their role as keepers of the water. After explaining the talking circle protocols, a talking stick made its way around the packed gymnasium. The talking circle last until 1:30 AM; everyone present was granted the opportunity to speak.

Individuals that I had interviewed attended the session, many sharing publicly the same discourses they had shared with me. I recognized the generic discourses of health, ecosystem health, water and food safety, spills communication and WIFN environmental philosophy and praxis. Also present were the nuanced narratives of the new mothers, Akii Kwe, fishers and hunters, elders and Heritage Centre researchers. Putting it all into context were the elegies and echoes of loss that framed almost every story shared. WIFN's thin and the thick descriptions converged at what can be described as the narrative nexus of toxic geography (thin description of chemical effects on natural environments) and toxic history (thick description of trauma endured through changes in social environments, e.g. residential school era). Together, these varied discourses constituted the scope and breadth of WIFN's toxic talk.

What was most interesting however, were the dynamic exchanges that took place between the two interpretive communities of Shell and WIFN. The former focused exclusively on thin description: content-rich discourses of chemicals (surface phenomena) that framed the environment as 'physical' and damages as those that are quantifiable; the latter focused more heavily on thick description: context rich discourses of structural violence that reframed environmental issues as part of the larger processes of colonization, oppression and social injustice. The WIFN discourses also situated the discussion of risk within a culturally informed framework that conformed to Anishinaabeg values and worldview.

The stories shared in the talking circle were infused with the same stories of loss of land, loss of culture, loss of language, loss of sovereignty, loss of autonomy

that were conveyed to me in the interviews through the elegies and echoes of loss. With every story shared, the WIFN residents resisted molding or conforming their toxic talk to Shell's narrow, Western framework of risk. The discourses exemplified the cultural miscommunication that comes from the collision of different interpretive communities and accompanying clash of divergent values and knowledge systems. Although members of both sides were engaged in conversation, the meeting was far from dialogic. There was no points of convergence to form a communicative bridge between the different interpretive communities. Instead of being engaged in dialogue, the two sides were engaged in two separate monologues, like two parallel lines that never meet. By juxtaposing the contesting WIFN and Shell discourses, I summarize some of the themes that best demonstrated the community's operationalization of toxic talk.

Water monitoring and scientific technical reports: Shell representatives wanted to talk about the details of their technical reports and issues specific to pollution. The industry touted their 'state of the art' water monitoring and filtering system and spill contingency plans in order to reassure WIFN residents that the company was dutifully complying with federal legislation regarding duty to consult and environmental laws. WIFN toxic talk represented counter-narratives that reiterated the community's position of "zero discharge", as well as the community's unique environmental philosophy regarding its responsibility toward the preservation of its rare and endangered species and ecosystems.

Forms of evidence: The Shell representatives were armed with massive tomes of scientific data that measured impact on a variety of fronts: air and water quality, noise

pollution, ecological impacts, etc. The community dismissed the information because it was inaccessible (there was no plain language summary of data); it was deemed irrelevant because of the community's lack of faith and trust in both industry (to act ethically) and the Canadian Government (to enforce legislation and properly regulate industry). The scientific data did not impress many community members, as most people relied on their own experiential knowledge and cumulative observations of change that were neither reflected in the conventional risk assessment model being employed nor "taken seriously" by industry representatives. The issue of different types of evidence (expert versus lay knowledges) added to existing tensions.

Effects of spills on the environment: Shell representatives were eager to advance the idea that very little environmental damage would be caused by the expansion. Their conversations focused solely on output measurements exclusive to their industry. Conversely, WIFN re-situated the discussion according to a deeper historical framework, emphasizing the cumulative effects of decades of spills into the St. Clair River and the fact that all industries are responsible for environmental damage, given the fact that most of industries (at one time or another, through instances of controlled or accidental spills) have been guilty of posing a threat to humans and ecosystem health.

Proposed land appropriation: Shell explained that they had gone through all the appropriate governmental, administrative and legal procedures for the proposed expansion and that they had secured all of the necessary permissions to proceed. They had approached landowners in the proposed expansion area and offered to purchase their homes at fair market value. WIFN reminded Shell that they had neither approached nor

consulted WIFN prior to their application. They also reminded them that the proposed refinery fell within the jurisdiction of Bkejwanong territory and that the First Nation had several active land claims moving through the court system. In order to engage in discussions about rightful ownership, the company would need to wait until after the WIFN land claims were settled.

WIFN ‘stakeholder’ designation: During the proceedings, Shell referred to all parties as equal stakeholders. This upset WIFN who asserted that they are not a stakeholder but a nation and that they wanted future interactions to follow a nation-to-nation model.

The ‘duty to consult’: Shell asserted that they were practicing good corporate citizenship and abiding by the duty to consult legislation. WIFN reminded them that WIFN had never ceded their land or water rights (or rights to the lake bed) and that by threatening the integrity of their lands and water through chemical contamination, Shell was also threatening their natural resources (fish and wildlife), thereby infringing on their Aboriginal Rights to hunt, fish and use their natural resources for sustenance.

Assessment of effects on local plants, fish and wildlife: Shell claimed that they had completed an environmental impact study assessing potential negative effects on the native plants and animals species in the area of the proposed site (Bickford Woods), and that they had found “no cause for concern.” After being questioned by WIFN representatives and consultants it was discovered that the Shell study was based on computer modeled projections and that no actual “on the ground” scientific inventory had been completed.

As the woods occupying the land of the proposed expansion represented an important

hunting and harvesting area, the community demanded a halt to the project because it posed a real threat to the local plants and wildlife and thus by extension, infringed on Native hunting and gathering rights. Akii Kwe held a water ceremony at Seeger Park to protest the expansion. As a part of this protest they planted butternut trees (an endangered native species) as a symbol of their advocacy work and also to remind people that the area is one where rare species and medicines grow and are harvested.

Separation of human health and ecosystem health: Shell asserted that they had looked into the human health effects that may be associated with the project. WIFN's consultant found that no such study had been completed. Again, Shell's projections were based upon computer generated models. Shell subscribed to the conventional Western model of envisioning human health as separate from ecosystem health and the health of animal and plant species. WIFN advanced their worldview which recognizes the interrelatedness of all living things. This belief was enacted discursively during the talking circle when specific individuals were chosen to speak on behalf of the plants, animals and the community's unborn children.

Economic growth: Shell emphasized that the expansion would create economic growth in the region and that the plant would provide jobs to community members. WIFN had (informally) conducted their researched of the numbers of Native workers employed at Shell and other Chemical Valley industries. They found that only a very small percent of refinery employees are Native. They also brought attention to the fact that very few First Nations people are able to complete the specialized training required to secure This kind of employment. Community members used this issue as a springboard to

discuss the structural barriers (poverty, social conditions) that have prevented Native youth from attaining postsecondary degrees. Elders spoke about the educational paradigms that do not recognize Native ways of learning. Many spoke of the residential school legacy and how this pedagogical experience and other forms of racism and discrimination had shaped Native peoples' relationships with institutions of higher learning.

The 'confounding variables' of health assessment: In response to the health concerns of residents, one Shell representative talked about the lack of evidence for the association between chemical exposure and human health. WIFN members responded with the evidence the community itself has accrued through lay epidemiology, experiential knowledge, traditional ecological knowledge and Western science. When one Shell representative tried to dismiss health issues as arising from other confounding variables, WIFN members engaged in discussions of how negative racial stereotypes of 'smoking and drunken Indian' are used by government political bodies and health agencies as a form of environmental discrimination to dismiss legitimate environmental concerns.

The issue of 'good corporate citizenship': Shell representatives attempted to project the image of Shell as a good corporate citizen that cares about the environment, and that engages in ethical environmental practices. Upon the request of the community, WIFN's consultant found evidence of Shell's poor corporate practices, blatant disregard for the environment and human lives and poor environmental track records in their factories abroad. Like Akii Kwe, the First Nation looked beyond the local realities to frame the

issue of water quality at the wider, global level.

“Trust-us” rhetoric: Shell attempted to convince WIFN that every partnership requires a relationship that is built on trust and good faith. WIFN reminded the representatives that Indigenous people had put their faith in such relationships before and that there was a legacy of broken promises and acts of bad faith that had been exercised by both the government and by industry when it came to dealing fairly with Native peoples. Given the unequal non-Native/ Native power relationship, WIFN residents implicitly asserted that trust would need to be earned through deeds and not words.

Economics-only framework: Shell tried to reiterate that the refinery was not a social or political issue but strictly an economic venture. WIFN continued to re-frame the discourses within a wider political framework. Community members pointed to internet blogs and newspaper clippings that revealed verbalized, racist attacks leveled against Walpole Island for protesting the expansion. They also talked about ecological degradation in the context of the structural violence of environmental racism. WIFN framed the argument within a larger political struggle for environmental and Native justice. They spoke of the struggles of the Kitchenuhmaykoosib Inninuwugcki (KI) First Nation, a Northwestern Ontario Native community whose Band Councilors had recently been imprisoned for opposing mining company operations in their traditional territory. WIFN political representatives explained how the WIFN Chief and Councilors had traveled to the community in a show of solidarity to lend their support to their causes.

Another opportunity to politicize the expansion project came with the visit of a high profile Native political representative. The environmental assessment process coincided

with a visit by Phil Fontaine, Grand Chief of the Assembly of First Nations, who was attending an event at Wallaceburg High School to witness the dedication of a memorial display to Burton Jacobs, a former Walpole Island Chief and strong political figure who was responsible for the expulsion of the community's Indian agent in the 1960s. WIFN took advantage of this opportunity to secure the National Chief's support in their struggle for environmental justice against Shell and discursively reiterated WIFN's role as trail blazer and political leader in the area of Indigenous self-government. The women of Akii Kwe took up the campaign of politicizing the issue further, by following up with a letter writing campaign to the federal government requesting an independent environmental assessment that would have more adequate Indigenous representation.

Measuring gains versus-losses: Shell's discourses promoted the rhetoric of the many gains that would be accrued through the development of the area and injection of revenue into the region. The capitalistic enterprise, modernism and everything that went with the project were glorified. Contrastingly, WIFN spoke of losses already endured: those of land, language, culture and identity all of which were similarly framed in the paternalistic government assimilation discourses as occurring "in the best interest of Natives" and "development in the name of progress."

Short-term versus long-term impacts: Shell's projections adopted a very short outlook into the future. In contrast, WIFN members discussed the cultural teaching of seven generations and how any decision made needed to be considered carefully because of its potential effects on future generations. Residents also used the sharing circle as an opportunity to educate Shell representatives on fundamental Ojibwe teachings,

including the circle of life, the seven grandfather teachings, the interrelatedness of all living things and the importance of balance and harmony to ecosystem and human health and well-being.

The WIFN narratives that emerged during the environmental assessment process revealed a highly organized series of attacks on several fronts (health, environmental, social, legal and political). In short, their discourses of resistance were rich with thick description. In this way, peoples' toxic talk revealed not only the community's environmental fears, but the very sophisticated modes and methods of agency and environmental activism practiced by the community as a whole.

The Shell expansion plan was ultimately abandoned. Although the company cited the economic downturn as the reason for not moving forward with the project, many people felt that it was largely due to the pressure placed on the company by WIFN during the environmental assessment process. The environmental discourses that were exchanged revealed the community's employment of a very sophisticated set of strategies in asserting Native rights in the domains of hunting, harvesting and environmental stewardship. The event also brought into high relief the ways in which the community was able to mobilize their discourses to play upon and take advantage of the existing fissures and fault lines of different ministerial regulatory practices, as they pertain to environmental stewardship and the mediation of risk. Basically the community (and their consultants) "fought" the proposed expansion on the community's own terms by putting their unique brand of toxic talk into action.

From Survival to Survivance

The ultimate form of resistance to the oppression of those who dominate, in whatever form it takes, is to survive (Vizenor 1998). *Survivance* in the form of Native survivance is more than survival, more than endurance; it is an act of presence. Gerald Vizenor's unique articulation of survivance (1998; 2009) is a response to the freezing of Aboriginal people in the myths and discourses of the western mind as "indian": a Western construction that is a simulation of many diverse cultures and stereotypes rolled into one that rob Native agency and efface Native identity. Words are all powerful in Anishinaabeg tradition. Vizenor uses the trickster as a form of survivance in his literary text. In the context of the Shell assessment process, the community employed their toxic talk to resist Western paradigms of risk and also to expand the interpretive matrix so that it is truer to the Anishinaabeg experience-that is, heavily historicized, politicized and understood within a larger culturally coded framework of structural violence. The narratives of resistance discursively move the participants (WIFN) from passive object to active subject, from survivorship to survivance. Toxic talk uses the power of words to help WIFN break free from the tokenism that often permeates bureaucratic junctures, like environmental assessment processes. Equally important, the WIFN community uses environmental discourses as an entry point for 'opening out' and making relevant to a non-Native audience the multiple issues that are intimately intertwined with environmental health threats affecting Native communities.

Deconstructing the various layers of discourses is critical at both the level of theory and praxis. The analysis of discourses at the level of thick description demonstrates the inefficacy of Western scientific paradigms and presents a more viable,

and accommodating alternative interpretive matrix for risk analysis. It also provides a context for understanding the intricate processes that underlie the communication of risk at the microcosmic level of community. The Shell project serves as an exemplar of the different communicative strategies employed by diverse interpretive communities. It also illuminates the primacy of the oral tradition as a powerful vehicle that continues to be utilized by Indigenous people in pursuit of attaining social and environmental justice.

CHAPTER SIX

Discussion and Summary

Chapter Overview

In this final chapter, I present the findings of the semiotic critique of the terms chemophobia and risk perception. These terms are problematic due to theoretical, methodological and ethical considerations. The Western assumptions that are built into these terms make them inappropriate descriptors and frameworks for understanding Anishinaabeg experiences. The critique provides the rationale for advancing toxic talk as an alternative matrix for studying risk. I present several points that support the didactic significance and advantages of adopting a toxic talk model. I go on to discuss prospective recommendations for research directions, many of which have a practical application to the WIFN community. I conclude the chapter with some closing remarks.

Critiquing ‘Chemophobia’ and ‘Risk Perception’

The power of words to alter reality is a cross-cultural phenomenon that permeates almost every dimension of social life. Those who wield the power to name also have the capacity to shape perceptions and by extension, influence human thoughts, behaviours and actions.

Medical language exemplifies the act of naming and claiming that which it defines. The implications of this process resonate in both public and private domains. The history and evolution of medicine as both a science and profession is as much a product of medical terminology as it is of scientific advances. The act of naming pathogens has shaped ideas about disease transmission and informed explanatory models

of pathogenesis and etiology (Anderton et al. 2004, Arnold 1988; Cunningham and French 1990; Dirckx 1983; MacLeod and Lewis 1988; McConchie 1997; Wain 1958). Identifying and classifying diseases and causes-of-death transformed the documentation of disease and how health patterns would ultimately be studied and interpreted. The early “periodic tables” of disease, known as medical nosologies, formed the proverbial backbone of the medical sciences and related disciplines (Bowker and Star 1999; Martin 1990). The formalization of this classificatory structures drew lines around broad fields of knowledge, creating standards of expertise by legitimizing some forms of knowledge while undermining others (through the separating out of specialists from laypeople). This ultimately enabled the transformation of the art of healing into an exclusionary science accessible to only a select few (Foucault 1973). “Medical-ese” indexes the power and status differences between patient and practitioner and contributes to the mystification of Western medicine.

Like their biomedical predecessors, the “linguistic artifacts” that form the vocabulary of environmental health research are similarly built upon a politicized basis and are encoded with their own set of values, symbols and connotations. The critique of Western environmental terminology that follows is based on what I heard from WIFN interviewees in private interviews and what I witnessed as “toxic talk” in action in their public discourses of resistance.

The fear associated with environmental concerns is labeled *chemophobia*, literally translated as “a fear of chemicals”. Scientists commonly alter this literal translation so

that it is imbued with the more value-loaded connotation of “an irrational fear of chemicals.” The categorization of “chemophobia” as a psychological symptom is ambiguous. Research studies have described the condition as a full-blown psychological phobia, despite the fact that authoritative clinical sources such as the *Oxford Dictionary of Psychology* (Colman 2006) and the National Institute of Health (2009) do not recognize chemophobia as a specific phobia or a psychological condition. Although the medical and psychological literature are rife with studies on the psychosocial effects of perceived risk, there is no clear consensus on whether there exists a suite of symptoms that can distinguish chemophobia from other forms of anxiety or stress. Consequently, chemophobia has been used rhetorically as a short-hand for “knee jerk” responses to environmental issues by non-experts. Recently, chemophobia has taken on a new set of meanings in academia where it has been used to describe student anxieties about learning chemistry. What is shared in common by both definitions is their use as linguistic markers of “laypeople’s” unenlightened and dubious relationship with “scientific knowledge”; the former representing a fear stemming from the perceived ‘lack of knowledge’ of laypeople, the latter indexing a fear of the process of acquiring this specialized knowledge by academic neophytes. Both definitions allude to the production and dissemination of knowledge; specifically; the accessibility or inaccessibility of certain forms of institutionalized knowledge. At the heart of chemophobia then is the contested dichotomy of expert versus lay or “uninstitutionalized” knowledge.

The lack of rigor in the use of chemophobia, its value loaded connotations and narrow interpretive framework came into full view during the course of my fieldwork.

The Walpole Island interviews revealed that environmental health concerns are embedded in local discourses and embodied by individuals in very distinct ways. The diversity of participant experiences conveyed through the heterogeneity of community narratives that I identify as “toxic talk” shed light on the limitations of chemophobia as a “one size fits all” descriptor of environmentally-orientated subjectivities. Further analysis has revealed that the problem of risk communication is rooted in the epistemological and ontological foundations of risk terminology. In the next section, I isolate and identify some of the Western philosophical underpinnings that inform the assumptions and value judgments conveyed by the terms “chemophobia” and (to a lesser degree) the more loosely referential term “risk perception”. As part of this epistemological exercise, I illuminate how these aspects are projected onto the subjectivities and “embodied experiences” of populations-at-risk.

Western metaphysics and ontologies

In conventional epidemiological research, the concept of risk emerges from a biomedical paradigm that draws heavily on Cartesian-Newtonian ontological assumptions. What Jacques Derrida (1967) calls the ‘metaphysics of presence’ structures much of Western philosophical thinking, which makes distinctions and formulates assumptions based on a logic of hierarchical, mutually exclusive oppositions that manifest as dichotomous pairs. The dualities of subject/object, culture/nature, individual/collective are common examples of dividing the world up in this way.

Cartesian mind-body dualism

Cartesian mind/body dualism is embedded in chemophobia creating a clear distinction between matters of the mind and matters of the body. Risk perception refers to the awareness and interpretation of risk isolated to the domain of cognitive processes and is distinguished from environmental pathology, which describes observable evidence of physiological trauma. In Western metaphysics, the mind is conventionally privileged in relation to the body. This duality is reverse in the case of chemophobia, where risk perceptions are framed and understood as a biomedical shorthand for irrational worries or fears that are considered as less pressing concerns than the more tangible and quantifiable physiological impacts of environmental contamination.

Dichotomy of “real” versus “imagined” risks

The dichotomy of perceived or ‘imagined’ risk versus ‘real’ risks denotes a hierarchy of risks coded with different levels of validity and legitimacy. This distinction often undermines the acceptance and recognition of psychosocial stress as a legitimate and serious consequence of environmental threats, despite the plethora of evidence that substantiates the physiological impacts of these kinds of phenomena. Classifying environmental concerns under the nebulous category of “risk perception” is a political maneuver that invalidates and dismisses environmental health concerns by “re-framing” such issues as “dwelling in the heads” of patients, rather than as cognitive schemata that index “real dangers in the real world” that warrant serious study.

Lack of standardized environmental risk perception survey tools

In the context of scientific inquiry, legitimizing and validating the psychological effects of chemophobia necessitates quantifying these outcomes. Despite the proliferation of risk perceptions surveys, there has yet to be devised a standardized measuring tool for measuring psychosocial stress that is tied exclusively to environmental fears. Neither has an effective method been developed for ‘parsing out’ stress that is caused by environmental concerns as opposed to stress associated with other sociocultural variables. Biomarkers, such as cortisol, have been used to measure population stress levels, however, this type of analysis is plagued by the same methodological issues that confound the interpretation of stress survey data (e.g. pinpointing the stress source). Even if cortisol testing were used as a potential biomarker of chemophobia, control samples are derived from “North American populations”, which means that there is very little research on standards of reference for culturally diverse groups, such as Aboriginal populations, thereby further confounding the capacity to extrapolate accurate and sensitive analyses of cross-cultural stress data.

The trouble with the designation of “phobia”

There are two problems that emerge out of the “phobia” designation of chemophobia. The first is that the “fear factor” insinuates an affective (emotional) rather than a reason-based or rational response. As a type of affect, the study of chemophobia and its various manifestations fall outside of the domain of science and its pursuit of “hard facts and answers” which in turn, precludes rigorous, concurrent scientific investigation of the risk in question. Again, this reorientation can be seen as a form of diversion from the real

issue at stake. There is an inherent paradox in the nature of diversion itself. The antidote to fear is knowledge. A logical response on the part of the research community would thereby entail a commitment to providing a solid research base to either affirm or discount lingering doubts. In contrast, labeling an environmental concern as a phobia and directing attention to the affective response rather than the source of the fear itself is futile. Neither does it serve the higher purpose of scientific advancement nor does it allay people's existing anxiety.

The “irrational” paradox

There are two more paradoxes that problematize risk perception research. Chemophobia refers to an “irrational response”, that is, an inability to reason. The question is: is ‘irrational response’ a proper description for subjective responses in cases where there is sufficient evidence of environmental degradation, as is the case at Walpole Island and surrounding St. Clair region? Given good reason and evidence, could one not argue that one would be reacting “irrationally” if they were not concerned of environmental risk, given the region's environmental history? Within this context, and by extension, does the very term chemophobia itself then, not seem as an unjustifiable, and even “irrational” descriptor of human thoughts and behaviours?

“The observer effect” paradox

There is often the assumption that the “diagnosis” or designation and study of “chemophobia” has the capacity to attenuate fear and stress associated with environmental issues. When the study of the perception of risk is accompanied with toxicological studies, and those end up verifying the severity of the source concern, the

risk perception research does very little to attenuate stress, aside from providing the cold comfort that the initial fear spurring the chemophobia was justified. Conversely, if scientific tests reveal no real threat, the stress of the study population is still likely to be amplified. In the case of perceived environmental health pathology, the debunking of one hypothesized source of illness will lead the sufferer to begin looking for another cause- embarking on a new quest for answers is equally stressful. There is another stress source that is present- that of the “observer effect.” Although this phenomenon has been identified in the context of other psychological studies (e.g. the Hawthorn effect on worker productivity, the “white coat” effect on patient blood pressure) it remains unexamined in the context of risk perception. The process of being studied and observed can evoke its own negative reaction. I witnessed this first-hand at Walpole Island in my capacity as medical anthropologist. Despite the research team’s attempts to reassure that the risk perception survey and blood and hair testing were primarily for the purpose of creating a baseline of data and that the study in no way assumed or reflected the existence of serious environmental problems as they related to community health, people’s fears continue to be amplified by the research itself, for the population reasoned that a study of this nature and magnitude would never have been initiated in the first place had there not already been strong evidence that there was a serious “looming threat” that jeopardized community health.

Scientific knowledge versus other knowledge systems

As a construct emerging from the biomedical and natural sciences, chemophobia is part of a larger knowledge system that values academic knowledges. The narrow academic

definition of knowledge precludes the incorporation of other forms of knowing, such as those that come from local or experiential knowledge (like lay epidemiology) and specific forms of local knowledge that come from long-term interaction with the land and ecosystems, as is the case with Traditional Ecological Knowledges. As evidenced by the WIFN narratives, community TEK has brought forth many innovative insights in the areas of environmental change, biodiversity and sustainable development. These knowledges have sown the seeds for important scientific research, introduced novel findings on cumulative environmental change and species populations unbeknownst to the scientific community and enriched existing scientific methods and approaches.

Objective versus subjective evidence

Chemophobia draws clear distinctions between the objective and the subjective. Quantifiable scientific evidence of ecological degradation and environmental illness are privileged over subjective assessments of risk and trauma that are shared anecdotally through personal stories. Chemophobia reinforces the dichotomy of individual versus collective. The individual body becomes the standard of reference and the conventionalized and accepted “unit of measure” for health outcomes. It also focuses on individual cognitive processes, experience and knowledge (largely considered in isolation). This stands in stark contrast to the Anishinaabeg acceptance of diversity and propensity toward integrative knowledges or standpoints, a point that I will elaborate on in greater detail in the section of toxic talk.

Narrow and exclusionary definition

Chemophobia is narrow and exclusionary, primarily as a descriptor of fears associated with man-made (usually industrial and agricultural) chemicals. By default, it fails to capture or index other equally destructive environmental dangers. At Walpole Island, invasive species, floral and faunal species endangerment and depopulation due to changing land use patterns, unsustainable development and global environmental crises, such as climate change, are viewed as being equally dangerous as the agricultural run off and industrial pollutants that compromise the integrity of the land, water and air.

In a similar vein, chemophobia draws a distinction between nature and culture by adopting Western criteria for identifying and categorizing toxic substances. The term is used exclusively to describe fears associated with the effects of exposure to industrial chemicals. As my research has revealed, alcohol and drugs are also considered forms of environmental toxins. As one elder astutely noted, “alcohol is a chemical because if it wasn’t, they wouldn’t say that you were intoxicated when you got drunk.” Both industrial contaminants and controlled substances are viewed by WIFN residents as being toxic and as emerging from the same colonial history. Both are toxins that emerged after contact (e.g. alcohol used in trade and industrial manufacturing occurring after land appropriation and development); both toxins thus literally and symbolically are viewed as “foreign intrusions” coming in from the outside via non-Native actors (White colonizers) and sites (factories). Both cause irreparable damage to the victim and have the potential for negative intergenerational effects.

Anthropocentrism

Risk perception in general and chemophobia in particular speak only to human experience; they are inherently anthropocentric, focusing on human health concerns to the exclusion of other beings. This construct is diametrically opposed to the Anishinaabe worldview that recognizes the interconnectedness of all living things, a belief poignantly expressed by the phrase *kina enwemgig* “all my relations” when referring to both plant and animal life. The very notion of perception, the process by which individuals attain awareness of the outside world conforms to a Western philosophical preoccupation with cognitive processes to the exclusion of information derived from different sensory modalities. Embodied knowledge and the complex layering of sensory information is crucial for understanding the lived experiences of Aboriginal peoples. For example, Hugh Brody’s *Maps and Dreams: Indians and the British Columbian Frontier* (1981) eloquently documents the diverse sensory capacities, memories, layered experiential terrains, phenomenal and epiphenomenal variables and forms of tacit knowledge that inform the practices of Native hunters. The embodied, sensory knowledge retained by those who live off the land was articulated in a comment made by a WIFN hunter, who noted that being a successful hunter depends on “a constant awareness of one’s surroundings, being in tune and in synch with the rhythms and ebb and flow of nature, processing different information on weather, direction, scent and physical evidence like tracks simultaneously and having the ability for both stillness and great speed.”

Ignores population variation

Conventional risk perception studies fail to identify population differences. Results are presented in aggregate form, glossing over the heterogeneity and variability of risk perspectives that provide valuable insights into the factors and forces that determine individual variability. By generalizing subject responses and masking differences between subjects constituting the study population, chemophobia perpetuates the construct of “community” (with a capital “C”) as a monolithic, unchanging homogenous entity. The research from this study has consistently shown that there are several communities within communities, many of which overlap, yet all of which share distinctive standpoints, socially situated and experientially defined views and concerns.

Negative connotations based on synonymy

The term chemophobia was disliked by WIFN community members because it sounded too much like chemotherapy which in turn, evokes negative feelings associated with cancer. Many community members believe that the community suffers from disproportionately high cancer rates that are the result of exposure to environmental contaminants. Despite the lack of clinical/scientific evidence to support or refute this claim, use of the term chemophobia appears to amplify this very palpable community fear.

The major issue: failure to contextualize

Chemophobia refers to a state of reality that is essentially ahistorical and decontextualized. It assumes that irrational fears emerge among laypeople simply due to a lack of relevant or sufficient knowledge. This assumption is based on the privileging of

certain knowledges and social standing. As the WIFN interviews have clearly illustrated, people have a great deal of knowledge about the environmental issues in their region despite not being formally schooled in environmental health issues. Although the mediatization of health information has contributed to people's knowledge base, the majority of people's understandings derive from their observations and interactions with the land, and personal environmental experiences. Another source of important information is the data gained and accumulated merely by living through a variety of documented ecological crises (e.g. chemical spills). Because chemophobia excludes knowledge derived from these two sources, it leaves us with a poorer interpretive framework for understanding the factors and processes that influence community risk perceptions.

Chemophobia indexes people's concerns about one specific issue (chemical exposure). These technical concerns can be extrapolated as commentary on the larger issue of environmental policies, regulation and sustainability within a broader social and environmental justice framework. Yet because these arguments are contained to a Western constructs of "chemical", "risk" and "environment", they do not contextualize these events within a larger socio-political matrix, thereby obscuring the relationship and connections between the structural violence that underpin both environmental crises and other forms of social and political injustices. The fact that WIFN residents wove narratives of environmental injustice and other social and political injustices perpetrated against Native peoples together, illustrated their attention to processes and not end results or "eventualities". Like the reserve system, Indian Act, land appropriation, residential

school legacy and outlawing of Aboriginal language, culture and spiritual practices, pollution or “chemical genocide” (as it was referred to by one WIFN resident) is seen as but one manifestation in a long history of colonial oppression and assimilation. The discourses of WIFN residents reveal that there is a strong connection between the healing of the earth and the healing of the Anishinaabeg people. The path to addressing and healing from ecocide and ecotrauma depends on the concurrent healing from historical injustice and trauma. Many people voiced that improving the health of Walpole Island’s ecosystems and inhabitants depends largely on reconciling past trauma, reclaiming one’s cultural identity through the restoration of traditional spiritual beliefs and cultural practices, the revitalization of the Ojibwe language (Anishinaabemwin) and gaining political control over Bkejwanong’s traditional territories. This fact alone addresses the need to broaden the definition of “environment” so that in addition to the natural environment, it includes the social, political, and cultural environments. In this way, environmental health encapsulates/indexes not only health effects resulting from toxic exposure, but also the mental, spiritual and physical sufferings brought about by specific processes and events in the history of Native and non-Native power relations. The Walpole Island data conforms to the integrative and broad analytical frameworks that Aboriginal scholars and activists have used to address environmental issues. Most notable is Winona LaDuke’s *Recovering the Sacred: The Power of Naming and Claiming* (2005) in which environmental degradation is framed within the larger historical and political contexts of colonization and its destructive materialization in the social and cultural

worlds of Indigenous peoples. These oppressive histories are as imbricated as the stories and generic narratives of trauma that are shared by WIFN elders.

Through the Thick and the Thin: A Blueprint for a New Risk Model

I began this dissertation with the example of Royal Polymers spill, and how it lays bare the issues that would eventually lay the foundation for the analytical approaches I enlisted to conduct environmental research at Walpole Island. At the theoretical level, the uncritical usage of biomedical risk terminology and adherence to an “essentialized” and monolithic notion of community spurred me to critique and deconstruct the language of risk and its various constructions within diverse interpretive communities. The narratives of different WIFN community members highlighted the importance of discourse analysis and led me to adopt a dialogic methodology. Through interviews with Walpole Island residents, I quickly learned that chemophobia could not accurately represent the many standpoints that coalesce to forge the converging standpoints that constitute a “community perspective”.

The emerging Walpole Island genre of “toxic talk” reflects a spectrum of concerns and experiences, from the generic narratives that embodied themes that were collectively held by a diverse cross-section of participants, to the nuanced narratives the minutiae of “raw human experience”. At its most basic level, toxic talk revealed the different standpoints of diverse interpretive sub-communities, their situated knowledges and the need for a model for risk perception that has the capacity to accommodate the objectives and concerns of different actors, one that presents a vocabulary of risk that is not tainted with stigma; and one that gives more attention to

the specificity of thoughts, actions and responses. A more thorough analysis of the environmental discourses revealed that narratives focusing on pollution represented forms of thin description because they conform to the “expectations of evidence” built into biomedical and scientific models of risk analysis, those that define environment as a strictly physical entity divorced or separate from human beings and their interactions. Accordingly, the narratives of thin description read like a laundry list of causes and effects of anthropogenic change and include proxies of risk, traditional ecological knowledges which illustrate what can be seen as community-controlled ‘natural science inventories’ of species at risk, and ‘lay epidemiologies’ of human health trends at WIFN. Conventional risk perception research would end at the level of thin description; however, reflecting on the conversations I had with individuals and further scrutinizing the discourses that emerged from these interactions illuminated the fact that the environmental discourses of WIFN were in fact just the tip of the iceberg. There was much more that lay beneath the narrative surface. That ‘something more’ was not superfluous or inconsequential but critical to the contaminants story at Walpole Island.

The thick description of elegies and echoes of loss and the discourses of resistance unveiled another story. At first, I wasn’t quite sure what to make of these discourses, not because they were unfamiliar (I was intimately aware of these stories as they had formed the basis of my Master’s research on historical trauma and its lingering effects on residential school survivors) but because I could not see how these discourses fit into the research topic of environmental health. The fact that the stories reached a

strong level of theoretical saturation signaled that whatever was being shared by the informants was perceived by them as being relevant and important to the topic at hand. These narratives were neither outliers nor the discursive ‘byproducts’ of confounding variables. Instead they represented a strong counter-discourse to the standard scientific models for risk analysis, particularly the study of risk perception.

To be able to see the relevance of these stories necessitated taking off the blinders of Western academic inquiry that had boxed in and framed my interpretive matrix of risk and which in turn, served as a discriminatory or biased analytical sieve that disregarded data that did not fall easily or unproblematically within the existing biomedical paradigm. Identifying the elegies and echoes of loss made it possible to break out of the conventional line of inquiry in environmental research. These genres of discourses required questions that were more philosophical in nature, such as “What is considered to be toxic in the context of an Aboriginal community?”

Surrendering to the insights yielded by “thick description” opened up avenues to gaining a better sense of what community members considered to be “toxic”. Their views included pollution and anthropogenic changes to the land, but there were other concerns that did not fall cleanly into Western ontologies of risk. These concerns reflect social injustices that are at the root of ecosystem health and community health. These issues would never come up as blips on the radar of conventional risk analysis studies, however they index the collision course of clashing worldviews that lies at the heart of divergent environmental practices and cross-cultural mis-communication. The elegies and echoes of loss revealed a long list of effects and unreconciled losses that have

resulted from colonization and assimilation. In this context, the reserve system, land appropriation, residential school, and Indian Act are toxic because they have caused social disruption, the erosion of cultural knowledge, the dissolution of family, nature and one's inner self and spirit. This state of disequilibrium, disconnection and unreconciled trauma has damaged the biological and social health of communities and impeded the path to healing.

This is reflected in some of the key insights that emerged from this deeper analysis of toxic talk at WIFN: human and non-human health cannot be considered separately, the natural and the social world are intimately connected, as are the health indicators that determine individual and community health. Environmental health, the study of risk perception and risk analysis at WIFN cannot be conceptualized or practiced in isolation of the social, historical and cultural variables that constitute its history and identity. Worries about pollution and environmental degradation are symptoms of larger processes of structural violence. In this regard, environmental problems are themselves proxies for understanding larger sociopolitical mechanisms at work or, as one WIFN resident put it, a window for viewing “the wheels of ‘injustice’ turning”.

Beyond mere theorizing, the elegies of loss provided culturally-sensitive practical insights relevant to the study of the psychosocial effects of environmental change. New environmental crises not only added an additional stress to WIFN members' lives but in many cases (especially for elders), they amplified existing stress by acting as a mnemonic trigger to past historical traumas. Conventional studies of environmental risk aim to measure and parse out environmental stressors from the ‘white noise’ or

background noise of “stories-other-than those of pollution”. In the WIFN case, the ‘white noise’ of interview data represented and encapsulated the larger extent of the problem.

The identification of discourses of resistance added another dimension to the analysis. Through the strategic use of their oral tradition, WIFN residents are attempting to achieve environmental justice by re-framing Indigenous knowledge as a valid and legitimate form of evidence. In the process, they are revitalizing their traditional values and practices while evoking community solidarity and cohesion. These narratives of are analogous to James Scott’s “weapons of the weak” but at WIFN, the discourses are active, vocal and deployed as a form of resistance (as opposed to non verbal ‘foot dragging’). The example of the Shell environmental assessment process revealed the dual aspects of “crisis”, and how WIFN members mobilized their discourses to turn an instance of impending environmental calamity to one of opportunity and empowerment.

Beyond resisting the machinations of local industry, the discourses of resistance play another important role that extend beyond the community’s territory. The analogy that First Nations are “the canaries in the coal mine” indexes Aboriginal peoples’ vulnerability and speaks directly to the looming specter of environmental destruction and what it means for all of the world’s populations. But the environmental discourses are effectively transformed into a political platform for the broader, thick description of Native issues (that are otherwise not usually within the frame of reference of non-Native populations). Through this discursive strategy, the community is able to transform an exclusively local issue into one of international and global magnitude and relevance. Furthermore, by laying bare the context of converging factors that have led to

environmental crises, WIFN is able to provide an international forum for Indigenous issues, evoking a social justice (rather than just an environmental justice) political platform.

As I listened to the WIFN Shell discourses, it became evident that the event was a public display of the discursive strategy participants were privately engaged in during the interview process. Just as informants resisted framing their perceptions and experiences according to my narrowly defined questions about pollution, the members of the talking circle were resisting the standards of reference and value systems of the industrial and scientific interpretive communities. Although the venue was meant to encourage dialogue, the discourses revealed two parallel monologues. There were no ruptures in the interpretive matrices of the different speech communities to allow for a true exchange of ideas.

Given the various levels of incommensurability and incommunicability, this begs the question: Was the WIFN toxic talk at all an effective mechanism for activism? At the theoretical level, I doubt that the WIFN discourses, (powerful as they were) were able to expand the Shell representatives' point of view or risk assessment models so that they were more commensurable to an Anishinaabeg worldview. However, the sheer tenacity, strength and cohesion exemplified by the discourse of resistance and survivance presented a formidable challenge to the army of Shell experts. Although Shell's public announcements surrounding the subsequent cancellation of the expansion project were framed as financial considerations flowing from the economic downturn, those who bore witness to WIFN's role in the environmental assessment process could

not deny that the environmental assessment process and by extension, the very trajectory of the expansion project itself were affected by Walpole Island's unique brand of environmental activism and the multiple political, cultural and social issues and fronts upon which this particular environmental standoff was waged.

Concluding the thesis with the Shell environmental assessment project represents coming full circle. The hermeneutic circle developed by "conversations within the situation" (Schon 1983) or in this case, conversations within the context of the talking circle of an environmental crisis have in turn, expanded both my own interpretive matrix for the study of risk, and laid the foundations for proposing "toxic talk" as an alternative way of conceptualizing and communicating risks.

Toxic Talk: An Alternative Way of Conceptualizing and Contextualizing Risks

This research illuminated all that is wrong with the terms chemophobia and risk perception. In coining the phrase toxic talk, I present an alternative term and context for understanding the conceptualization of risk at WIFN.

Toxic talk is the purposeful coupling of two words that index danger (toxic) and action (talk). The term is discourse centered, focusing attention on the importance of what is said and how it is said. It is dynamic and accommodates for discursive interchanges through dialogism. It is also action-centered, moving from "phobia" (a state of passive fear and affective reaction) to the action of "talk" and the dialogic realm of speech. This discursive reorientation alters the framing of the referent from chemophobic object (read: passive victim) to engaged subject (read: active subject)- a more

empowering framework for interpreting subjective experiences.

Toxic talk is polysemous; it can be interpreted in several ways, and embodies different meanings. The phrase can be interpreted as referring to the danger of chemicals. Alternatively, it can be understood as alluding to the danger of the communication of risk and how the very act of talking about dangers of this nature can be toxic, especially if the communication or dissemination of this information leads to heightened levels of anxiety. Research has revealed a correlation between environmental concerns and elevated stress levels. Frame within this context, what is toxic or dangerous is the amplification of fears by communication (e.g. media reports) and local narrative exchanges.

Chemophobia refers to a specific population. Those described as chemophobic are “ignorant laypeople” while scientists are “experts” who are the sources of reasonable and rational answers. This dichotomy creates a hierarchy of knowledge holders: chemophobes are the “laypeople” characterized by “irrational concerns,” while scientists are the “experts” who try to attenuate these fears through scientific knowledge. Conversely, toxic talk does not exclusively describe a certain speech community; toxic talk may be used to refer to the narratives of laypeople, the technical talk of environmental scientists, the legalese of environmental lawyers and policymakers or the public relations discourses of PR industry representatives. An elder, speaking of a Shell representative’s presentation, illustrated this point when she stated: “the lies he speaks, his words are toxic. It is like the words he speaks are like chemicals pouring out of his mouth”. In this context, the term can have another layer of meaning: discourse that is toxic because it is not transparent or honest; one that is filled with falsehoods and untruths that result in actions that threaten

human and ecosystem health.

In toxic talk, I find resonances of the pharmakon. In “Plato’s Pharmacy” (1972) Jacques Derrida conducts a close reading of Plato’s *Phaedrus* to illustrate how the philosopher’s hard and fast distinctions between philosophy and mythology are actually undermined by his own logic and rhetoric. Derrida’s main tool of deconstruction is the pharmakon- the Greek word for both “poison” and “cure.” For Derrida, the pharmakon is the vehicle for his very special brand of “play,” a play on words, but also a play with logic, the tangible world, and the supposedly sacrosanct and empirical truths that Western philosophers established in times past. One of the main ideas that Derrida refutes is that of “binary opposition” or *coincidentia oppositorum* (Derrida 1972: 93). The very ambiguity of the “pharmakon” serves as an example of the kind of thing that cannot be contained within Platonic categories and thus represents the breakdown of these dualities.

I identify a similar pharmakon-like mutability in toxic talk. On the one hand, WIFN narratives of loss and distress disclose the various forces and factors, both environmental and social that have come to “poison” their community. On the other hand, toxic talk can also be seen as an “antidote” to this toxic colonial history for it is through the discourses of resistance and survivance (conveyed through the oral tradition) that WIFN residents have been able to resist and overcome environmental threats and other encroachments onto their territory. Toxic talk also embodies *différance* (a word that is the combination of difference and deference) that points out that meaning isn’t the signifier itself, but that it only exists in a network, in relation to other things. *Différance* comes *before* being. This throws the idea of “origin,” of true original meaning into radical

question (1972:114-5). Différance can be envisioned as a form of “play” a kind of game where winning and losing happen in turn (as opposed to thinking of this problem as the absolute loss of meaning) and as something that has some “play” in it, like an “articulated” joint (1972:122-3). As Derrida points out, Plato’s discourses cannot tolerate the possible contradictions, or “differences” inherent within the meaning of the terms he uses. He therefore tries to hide these differences to promote the coherence of his argument by emphasizing one definition over the other, thereby providing a partial and incomplete view. This intellectual ‘sleight of hand’ is adopted by researchers who uncritically use chemophobia and risk perception as ‘generic’ descriptors that are pre-meditatively encoded to index or emphasize certain things and to obfuscate others. By placing taken-for-granted terms like chemophobia and risk perception under ‘erasure’, we see how these terms are founded upon Western metaphysical constructions of ‘environment’ as land divorced from human interaction, ‘human health’ as humans separate from animals and the individual separate from the collective, ‘community’ envisioned as homogenous and monolithic and human experiences and embodiments of risk as untainted and uninfluenced by historical contingencies and political processes.

In sum, toxic talk enables one to step away from conventional ways of describing environmental concerns and by extension, conventionalized ways of envisioning the natural world. This alternative term to chemophobia provokes the reader to pay attention to the ‘slipperiness’ of meaning, provides an alternative framework within which to analyze how words are used to represent “reality” and introduces an interpretive matrix that increases play and opens out the exploration of layered meanings.

Re-envisioning and Re-framing Risk Within the Interpretive Matrix of Toxic Talk

In summary, the following section summarizes the theoretical contributions of toxic talk to the study of risk perception. The list lays out the groundwork for the development of a more culturally and discursively framed protocol for environmental risk research and communication.

The Advantages of Adopting a Toxic Talk Discursive Framework

Accommodates a diversity of perspectives and experiences

Toxic talk opens out the narrow interpretive matrix of chemophobia. It is a phrase that indexes actors' diversity of perspectives, knowledges and environmental concerns. In short, it acknowledges and accommodates multiple community standpoints and situated knowledges.

Facilitates dialogic analysis

As a phrase that is based on a communicative action (talk) it calls attention to the dialogic versus monologic construction of risk. The concept of risk and how it is gauged and perceived are constantly negotiated within social, cultural and political realms. Discourse is the vehicle for contextualizing and gaining a more nuanced understanding of this form of mediation.

Applicable to the risk discourses of different interpretive communities

Toxic talk is versatile as it is non-specific to the referent population. Unlike chemophobia that isolates and refers to the discourses of one group of people (laypeople), toxic talk can be used to describe the speech communities and interpretive communities of diverse actors (scientists, government, lawyers, industry) in the environmental debate. As a nexus

of communication, it brings together the different standpoints, perspectives and concerns of the public, academe, industry and government. It is a discursive interface and conceptual field for evaluating the synergy, syndesmos and synthesis of different narrative themes.

Polysemous and embodies différence

Toxic talk emphasizes the polysemous nature of risk dialogue. It embodies the Derridean notions of pharmakon and différence with respect to the processes of knowledge production and meaning making. It also sheds light on the ‘undecidability’ encapsulated in the very negotiation of risk in the social sphere, the slipperiness of meaning and the importance of power and process in this communicative field.

Discourse-centered

The emphasis on “talk”, on stories shared and exchanged in the communicative sphere is commensurable with the Anishinaabeg oral tradition. The standard measurements of environmental change may be based upon academic sources of evidence (e.g. written studies and scientific experiments), but in Native communities it is the spoken word that is the primary vehicle for conveying environmental philosophies, ethics, practices and risks. Emphasis on dialogue indexes how meaning is created and knowledge is transmitted in a non-Western context. It goes beyond Western psychology’s focus on the individual’s cognitive processes (e.g. what is going on in people’s individual minds and lives), to discussing how opinions and standpoints are the accumulation of discourses and experiences exchanged, mediated and integrated via storytelling, sharing of life histories and cultural transmission of Indigenous knowledges.

Broadens the category of ‘environmental risk’

The term is accordian-like in nature and has the capacity to both contract and expand the interpretive matrix within which such risks are framed and envisioned, as needed. As the interview data has shown, the concept of chemophobia is often too specific: it defines man-made chemicals as the only form of environmental risk, to the exclusion of other equally harmful human impacts. Toxic talk does not refer to any specific factor contributing to the risk, thereby opening out the discursive themes that might be identified as fears and stressors, whether they involve involuntary exposure to the toxic effects of industrial pollutants or voluntary exposure to the “social pollutants” of drugs and alcohol. Just as grounded theory does not impose a topic on the research project, toxic talk does not limit the parameters of environmental research exclusively to the discussion of contaminants. It allows themes relating to what is considered toxic or harmful to “emerge” through the iterative process of data collection and analysis.

Emphasizes local history and lived experiences

Toxic talk alludes to a very specific form of dialogue, one which is local and which refers to the experiences and ecological knowledges tied to a specific local area, which is commensurable with the specificity of Indigenous knowledges and notions of space and home place. In Mide teachings, an individual is given a set of gifts. Among these is the choice of parents and how and when one enters and exits the world through the processes of birth and death. One’s place in the social and natural world is pre-determined before one’s birth. Where one is born becomes part of one’s cultural, physical and spiritual identity. Apache philosopher Viola Cordova has highlighted the Indigenous sense of

boundaries and the influence of the recognition of bounded space on settlement and interaction patterns, traditional ecological knowledges and sense of environmental responsibility. Toxic talk facilitates this kind of framing.

Emphasizes human agency

Toxic talk helps to move risk research beyond the objectification of the study subjects. The term signals a transition from framing interviewees as passive objects to active subjects. Rather than framing study groups or populations as prisoners of their own fears (a self-fulfilling prophecy of the “fear factor” encoded in the term chemophobia itself), toxic talk allows for the re-framing of participants as empowered actors actively engaged with the issue through the medium of communication. In other words, it mobilizes and facilitates the discursive re-framing of Indigenous peoples from survivorship to the more empowering state of survivance.

Breaks free from Western philosophical constructs

Unlike chemophobia and risk perception, toxic talk is not constrained or delimited by the rigid dualistic ontological structures of Western philosophy, thereby facilitating the exploration of human thoughts, experiences and actions within the background or matrix of their own “backgrounds” or cultural worldviews.

Promotes the contextualization (historicization and politicization) of environmental threats

Toxic talk promotes the contextualization, historicization and politicization of environmental crises and health risks. The Western academic world’s preoccupation with labelling, sorting and classifying phenomena so that they fit into “neat boxes” is exemplified by biological reductionism in biomedicine where the pathogen is the centre

of attention. This tendency dismisses issues relating to pathocenosis and disease ecology that are the basic conditions that allow a disease to thrive and spread. Biocultural anthropologists have critiqued the fetishization of pathogens and the narrow focus on proximate causes of disease as a political act that diverts attention away from the structural violence that is the root of sickness, particularly among the poor, marginalized and disenfranchised. Critical medical anthropologists are proponents of research models that promote “looking upstream” to identify the converging political, social and economic forces that are the ultimate cause of disease. Chemophobia replicates biological reductionism by obfuscating the social context of risk perceptions. Toxic talk “rationalizes” the psychosocial phenomena labelled as irrational fears by putting the concerns into context. In the case of Walpole Island, framing narratives of risk within the region’s environmental history allows one to re-interpret their perspectives not as symptoms of ignorance or unwarranted imaginary panic, but as the product of decades of ecological crises and deteriorating trust in government and industry, which many feel are another manifestation of colonization. This shifts the issue of chemophobia as something that dwells in people’s minds to a more sensitive reading of documented historical environmental events and people’s responses to such crises. This element of toxic talk reiterates the fact that no phenomenon, be it chemophobia or any other aspect of environmental pathology emerges from within a “vacuum” devoid of the influence of social, political and cultural processes.

Emphasizes 'intentionality'

Etymologically, the 'toxic' in toxic talk captures ideas relating to 'intentionality'. Many people, Aboriginal populations in particular, consider environmental degeneration as a coordinated form of chemical warfare; ecocide is envisioned as another dimension of cultural genocide. As one elder noted, "chemicals are this generation's poison arrows." The word toxic reflects this notion of intentional harm by its very etymology. *Toxon* is derived from the Greek word for "arrow" and is traced back to the use of poisoned arrows in warfare. The emphasis on agency is extremely important in Aboriginal narratives that identify a continuity between imperial expansion and modernization and capitalist economies. The framing of contaminants as the smallpox blankets of the 21st century exemplifies the need to situate what appear to be relatively contemporary problems (environmental degradation and environmental health) within the "deeper time frame" of colonial history. Therefore using a term that indexes environmental destruction with warfare brings much needed attention to the centrality of past power struggles, social injustices and Native non-Native politics to Anishinaabeg conceptualizations and interpretations of contemporary risks.

Extends the analysis of risk beyond the study of cognitive processes

The toxic talk framework makes it possible to expand the conceptualization of risk as a matter that extends beyond the strictly cognitive. The focus on lived experiences lets the research move from risk perception to risk realities and risk embodiments. Attention to the visceral impacts of environmental concerns grounds human experiences, "makes them real" and 'legitimizes' them by rooting them in local histories and social realities.

Promotes a more philosophical study of the notion of 'toxicity'

Toxic talk allows one to pinpoint the real source of the problem. It prompts the researcher to ask the deeper questions: “What is it that’s really toxic to this person or community?” “How is the concept or term “toxic” being used as a metaphor by informants to discuss events and processes that are viewed as being harmful?” and “What does the data distilled through toxic talk narratives reveal about the worldviews and lived realities of those whom we study that cannot be attained by any other means? The Walpole Island toxic talk reveals that what is toxic to the lives of residents, goes beyond the fear of chemicals and their impacts on WIFN ecosystems. The central theme of toxic talk was loss; material and symbolic unreconciled losses that have compromised the integrity and identity of Aboriginal peoples and that have directly and indirectly compromised ecosystem and community health. At WIFN, species at risk is used literally (to describe decreasing biodiversity from a number of anthropogenic threats); it is also used metaphorically to describe the overt and covert processes that compromise Aboriginal health and autonomy. Speaking of the SAR legislation that puts rules on island development, one resident noted that “we have another species at risk, the endangered flowers that are our children that are equally deserving of a safe environment to grow up in.” In many ways, toxic talk is used as the metaphor to broach larger socio-political issues, which in turn, provide a critical interpretive context for the microanalysis of related phenomena. Understanding the unique politically and socially derived stressors and traumas affecting Indigenous peoples is a necessary prerequisite for studying the health of Aboriginal communities. Historical trauma and psychological and physiological

health issues emerging from an oppressive history form the substrata upon which contemporary health issues, including specific environmental health issues are superimposed. Populations whose immunity has been compromised by syndemics and psychosocial trauma experience an amplification in existing health conditions and are more vulnerable to emerging disease threats. The importance of health context (a concept that has always been important in Anishinaabeg culture) for understanding the trajectory of disease outcomes is now being recognized by the social and natural sciences. Toxic talk indexes the importance of health histories as important interpretive matrices for diagnosis and prognosis.

Encourages polyvocality and polyocularity

Toxic talk encourages polyvocality and polyocularity (seeing and acknowledging multiple perspectives) in the study of risk. It facilitates the application of multiperspectival approaches, such as standpoint theory and grounded theory and is able to accommodate the diversity of ecological knowledges that emerge from narratives shaped by the different variables such as age, gender, occupation and spiritual beliefs. Toxic talk indexes the importance of these factors for gaining an appreciation for the variability of the construction of risk, dissemination of risk information and the diverse attitudes and behaviours that determine differential courses of environmental advocacy and activism.

Facilitates the study of a “collective phenomenology”

Toxic talk frees us from “the individual” as the unit of measure for physical and psychological phenomena. In the case of Indigenous populations, it allows for the framing

and interpretation of risks within a more culturally-appropriate “collective phenomenology”. Community members’ toxic talk offers a clear vantage point for observing the inner-workings of cross-cultural psychology. I anchor the acceptance of different “ecological knowledges” to the Anishinaabeg respect for variation in individual knowledge and experience and the propensity toward integrative knowledges and holistic models. I describe this way of being in terms of a phenomenological and embodied model of a *collective phenomenology*, which differs from a Western phenomenology of experience that is based almost exclusively on individual psychology. This cognitive orientation to the world (and the place and function of the people who dwell in it) recognizes that specific types of knowledge are not distributed equally and are the domain of different knowledge keepers, a model of society which Anthony Wallace (1970) describes in terms of the “organization of diversity” rather than the “the replication of uniformity”.

This ethos is made manifest in the domain of communication. Because experience is the basis of authority to speak, First Nations reports of events are clearly marked and expressed as firsthand “witnessings”. Although the “telling” of experience is discursively framed in personalistic terms, speakers do not hold a strictly individualistic ethos. Despite recognition that certain phenomena are experienced by individuals likely to evince certain qualities, traits or expertise, the experiences of others are generally accepted as valid and credible, even among those who never have personally experienced anything comparable. In the Anishnaabeg worldview, information can be received through personal experience, through the experiences of others and through dreams. This

opens out the possibility for re-interpreting the minutiae of human experience and interactions within the context of a collective phenomenology in which reported experience becomes community knowledge.

In *Life Lived Like a Story* (1990), Julie Cruikshank frames the stories of three southern Yukon women elders who used traditional stories as a template for their personal experience in terms of such a phenomenology. The stories gave meaning to experience and provided an interpretive matrix. The women wanted to tell their stories for their children and grandchildren so they would know how people used to live when everyone grew up traditionally. The experience of these women became collective or generic when through being framed in story. A single person's experience becomes intelligible and resonates for others when it is told in relation to the experiences of others.

Non-stigma bearing

Unlike chemophobia, the term is not stigma-bearing. There are no value judgments embedded in toxic talk. The phrase creates a context of neutrality for the articulation of ideas and experiences. It can also be used as a "corrector" of the problematic essentializing and homogenizing conceptualizations of "chemophobia" and "community" that continue to proliferate in the both the health and social sciences.

Facilitates the identification of diverse interpretive communities

The micro-complexities of contaminants narratives reveals the tension of similarity and difference, of homogeneity and specificity, of individual and collective- theoretical quandaries that have been part and parcel of the anthropological endeavour. Toxic talk is a useful methodological tool for critically engaging with one's data in the difficult

process of explaining and rationalizing the parts from the whole, the trees from the forest, and in a cultural context, parsing out the features that are commonly shared by the world's diverse cultures/populations and what set them apart. Toxic talk allows us to identify the boundaries and features of different interpretive communities. In so doing, it allows us to delve into a deeper study of language and the philosophical underpinnings of culturally informed cognitive maps and the enactment of these distinct ways of being in the world as social practice. The discursive turning away from conventional sociological and psychological studies of risk is epistemologically didactic and also empowering. It allows a breaking "out of" the boxes of Western ontologies of biomedicine, science and environmental science. It creates a space for meaningful dialogue between interpretive communities and allows for the incorporation of marginalized knowledge systems such as Indigenous epistemologies.

Conducive to interdisciplinary research approaches

Toxic talk is conducive to interdisciplinary research approaches. It accommodates the application of a range of theories from a variety of disciplines, such as "reading against the grain" (history), "looking upstream" and "syndemics" (anthropology), grounded theory (sociology), standpoint theory and situated knowledge (women's studies), discourse analysis (linguistics), and deconstruction (literary theory and culture studies). Its emphasis on dialogism and context allows researchers to tailor the presentation of results and findings within culturally appropriate explanatory frameworks.

Capacity to illuminate different forms of environmental action

Toxic talk provides a context for moving the analysis of environmental concerns from the reactive (characterized by a sense of fear and loss of control) to an emphasis on action (characterized by courage, perseverance and regaining of control on the part of the affected population). Toxic talk has the capacity to showcase forms of activism.

In sum, toxic talk has proven to be an important heuristic device that has revealed the inapplicability of biomedical terms such as chemophobia and risk perception. It has fostered the development of an expanded model for risk that expands beyond industrial contaminants and Western construct of “environment”. It has inspired a conceptualization of the etic use of the concept of “toxic” itself and how it differs from the risks that the study population feels is literally and metaphorically “poisoning” community health and well being. Finally, it has illustrated how environmental crises were transformed into opportunities of balancing unequal power relations between Native and non-Native actors and exercising self-determination.

The writing process has served as the secondary ethnographic lens through which I have viewed and re-viewed the subject matter of this research endeavour. Like a microscope, getting a clear and whole picture of the subject matter in this case, the environmental debate as it is conceived and unfolds in the Walpole Island community required a constant readjusting of sharp focus and depth of field. The combination that provided me with the best ‘view’ was that which was able to easily accommodate individual features (perspectives, experiences and practices) within a collective whole without losing their distinctiveness or identity. In terms of the communicability of risk, the WIFN matrix for toxic talk was able to best strike that delicate balance by

providing a model for the structured polysemy of risk that are encapsulated and interpellated in the discourses of the WIFN interpretive community. It is my hope that the preliminary framework of toxic talk schematized in this research project can serve as a baseline for forging more effective models for communicating and interpreting risks. At the very least, the insights provided herein may be able help to re-calibrate the cross hairs of anthropological research instruments (theory and methods) so that the microscope through which we view the world can better accommodate and represent the worldviews of the “others” whom we study.

Recommendations for Future Research

Like other Native communities, Walpole Island has been “researched to death.” From the beginning, I have endeavoured to frame the project in terms of an applied anthropology that will (in the spirit of participatory action research) be useful to the community.

Toxic talk is only one component of this study; in the process of thesis writing, many other trajectories for research have emerged.

Tailoring risk communication and information to diverse interpretive communities

The toxic talk of Walpole Island residents identified certain community research needs. Chief among these is tailoring risk communication protocol and environmental health education to the knowledge needs of specific community subgroups. These could include research to create community specific and culturally appropriate fish consumption guidelines for the Walpole Island community and presentations to specific departments regarding safe levels of fish consumption for women of child-bearing age and expectant

mothers.

Satisfying the need for WIFN environmental health educational resources

Conversations with the community's Healthcare Centre identified a community need for environmental health information and education. This falls under the Health Centre's mandate of providing the community with preventative care and health information. A feasibility study to pinpoint specific environmental health needs and information needs would be appropriate.

The need for a critical review of the community's emergency contingency plan

Community members are dissatisfied with the current spills reporting procedures. This warrants a study on the community's existing emergency contingency plan to see if any improvements can be made to increase the expediency of spills reporting to the community and improve the community response to environmental crises.

Determining community bottled water usage

The research revealed that a large number of residents drink bottled water, although this is economically prohibitive for some families. This warrants looking into the possibility of subsidizing bottled water for community members. A study to assess the numbers of individuals using bottled water would help to assess if this type of program would be welcomed and whether it would be feasible to the community.

The need for research on women's health and children's health

Epidemiological research has revealed that mothers and their children are most at greatest risk for chemical exposure. However, very little study has been done on this issue at Walpole Island. Most of the time, important information regarding reproductive health

and children's health is overlooked. I am developing a qualitative methodology for gathering health data on miscarriages, reproductive problems and child development issues that are not easily captured by Western survey tools, on account of the difficulty involved in tracking this information and reluctance to share such information through conventional means, due to the sensitive nature of the topic.

My upcoming SSHRC-funded project entitled, "Letting the body tell its story": An alternative model for mapping health outcomes" will be conducted in collaboration with the women of Akii Kwe, the Heritage Centre and the Health Centre. The project will address the shortcomings of conventional biomedical approaches to gathering and analyzing health data from Native communities. This research will help to elaborate a community controlled epidemiology that will form an important health research database for the community.

Devising a WIFN protocol for community environmental health research

My role as consulting medical anthropologist on a medical research team, together with my field research experience has provided many insights into the challenges of conducting environmental health research in an Indigenous community. Drawing on this experience, I am creating a protocol for health research that can serve as a community resource and reference guide for future researchers wishing to pursue future research of this nature at Walpole Island.

Other parts of this research will serve as an instructional tool and resource base for community members and other researchers interested in learning more about Walpole Island health history, health worldviews and cultural practices. I will be presenting the

findings of these projects at community gatherings and pursuing conversations with community health care providers and environmental researchers to assess how these components of the research project can be best used to improve health communication and health services.

Medicine Wheel educational model for cartographies of environmental risk

This research has contributed to the schematization and development of *cartographies of risk* where the nuanced narratives of WIFN interpretive sub-groups are mapped using the Indigenous model of the Medicine wheel. This template may be used as an educational model in the community (particularly for health care and mental health providers) to illustrate how environmental concerns at WIFN are “embedded in discourses, and embodied in individuals” in very distinct ways. This model may be useful as a guide for formulating more effective occupation, gender and “life-cycle” specific teaching tools for disseminating information about environmental hazards and satisfying the risk communication and instructional needs of different WIFN sub-interpretive communities.

Clan-based WIFN environmental stewardship model

The WIFN toxic talk has revealed a *genealogy of environmentalism*- that is, the delegation of environmental responsibilities according to clan membership. Explicit examples were drawn from the Akii Kwe environmental group and other community members. This analysis can provide an important basis for reinforcing and reaffirming the burgeoning revitalization movement of cultural traditions and teachings in the community and make explicit their practical value in the sphere of environmental protection.

Expanding the historical context of Walpole Island community health

My previous research (Stephens 2004b, 2008, 2009) has laid the foundations for a historical epidemiological study that is the first of its kind to be conducted on Walpole Island First Nation. I wish to continue this research through further analysis of health data from various time periods and to use the lessons of past health events as a map for understanding contemporary community health threats and crises, a research endeavour. I have already commenced through the analysis of historical water quality issues in the community.

Studying the fissures and fault lines of environmental risk regulation and risk management

Discourse analysis of the SHELL environmental assessment process has opened up the opportunity to examine how the community engages with regulatory bodies (e.g. Government, Industry) that govern environmental policies and practices. The findings from this dissertation will serve as a point of departure for a microanalysis of how the community discursively mediates these diverse interpretive communities and uses the fault lines and fissures of existing legislation governing environmental law and Native issues as a vehicle for mobilizing advocacy for WIFN self-determination in the areas of environmental management and stewardship.

Illuminating epistemes of environmental crises and chronotopes of resistance

I have identified four events that qualify as (what I have called) *epistemes of environmental crisis* (instances that have informed WIFN constructions of risk) and their accompanying *chronotopes of resistance* (the mobilization of specific forms of activism in time and space). I will elaborate on how these critical environmental events have

become embedded in the collective conscious of the community and influenced environmental philosophy and praxis.

A model for psychosyndemics

The elegies and echoes of loss form the foundation for a more sophisticated model for analyzing trauma in Native communities. I build upon Merrill Singer's concept of syndemics to coin the term *psychosyndemics* (Stephens 2009) in order to describe the cumulative effects of multiple historical traumas and their effects on community stress responses to contemporary threats, such as environmental stressors. The hypothesis I propose is that just as concurrent epidemics (syndemics) compromise the immune response of populations and amplify the effects of disease outcomes, cumulative traumas have a similar biosocial effect on populations and amplify the stress responses to contemporary threats, such as environmental crises. This research will also work to further operationalize the concept of structural violence as a qualitative health indicator.

Concluding Remarks

In the face of trauma and the contingencies of everyday life, theorizing crises is often not at the top of the list. McKinlay (1979) and Goodman and Leatherman (1998) however, present a parable that underscores the practical relevance of "looking upstream" to the larger factors and forces that influence human health. It is the story of a physician who while walking along the shore of a swiftly flowing river hears the cries of a drowning young man. He rescues him and resuscitates him to hear another cry from the river, another drowning man whom he saves. His is repeated again and again, until the

young man finally realizes that he's so busy with the rescue that he's had no time to see who up the river is pushing them all in (McKinley 1986:13). The moral of the story is the importance of "looking upstream" at the ultimate rather than the proximate causes of disease and illness.

The story is particularly fitting for Walpole Island, both at the level of "thin description" and "thick description". Looking upstream from WIFN reveals the landscape of "Chemical Valley". The toxic talk of WIFN residents sheds light on the range of community fears that emerge from living in the shadow of one of Canada's largest petrochemical centres. However, lurking beneath the surface of the discourses of pollution and anthropogenic changes lies another story. The elegies and echoes of loss reveal experiences of trauma and loss that are equally troubling and distressing, the emotional wounds that are the product of various forms of structural violence that have been exerted against Native peoples. It was these discourses and the discourses of resistance that allowed me to look upstream differently; in a way that does not focus exclusively on chemicals as the only source of Walpole Island's concerns, but which views environmental degradation as a symptom of a much larger problem; one that is rooted in overarching, long-term historical and political processes and injustices. In the case of my research, looking upstream meant engaging in a more sensitive analysis of structural violence in all of its forms, and analyzing these phenomena and the clues they hold to the 'ultimate causes' that have literally become toxic to the lives of Walpole Island residents.

Following this research path has allowed me to step outside of the conventional Western scientific paradigms of environmental risk analysis to gain a broader and more contextualized understanding of how Walpole Island residents, view, understand and respond to “risk” and to advance an alternative research framework that allows for a more historicized and humanized view of environmental health concerns in the community. In so doing, I hope that this research helps to expand in a meaningful way our current understanding of the physical, emotional, mental and spiritual dimensions of what Western science has glossed as chemophobia, and furthermore, that the insights gained can serve as the stepping stones for further exploration of this topic.

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Appendix A
Interview Consent Form

Walpole Island, R.R.3
Wallaceburg, Ontario
Canada N8A 4K9

Dear _____ :

RE: Community Perceptions of Environmental Change and Health Risks at Walpole Island First Nation Study

Thank you for agreeing to participate in my study. Before I can interview you, I will need you to give me your consent to participate in the study. By giving me your consent, you acknowledge that you:

- have been given an oral and written explanation (letter of information) of the study;
- have been given the name and contact information of myself and the members of my research supervisory committee;
- understand that you can choose to take part or not to take part in the study and can stop the interview at any time;
- understand that your identity will not be revealed and all opinions you express will remain confidential;
- have been given the chance to ask questions about the study and understand that you can ask more questions at any time;
- have been informed that the information you give me will be part of my doctoral dissertation;
- have been informed that the results of my study will be given to health care providers and organizations in the community to inform them of community members' experiences and concerns.

If you understand this and agree to the information you contribute being used in this way, I would appreciate it if you would sign below and return this letter to me. I need this for my records.

If you have any questions, I would be pleased to discuss them with you.

Miigwech,

Christianne Stephens

I understand the above and consent to the information I provide to be used in the way described above.

Date: _____

Signature: _____

HONORARIUM REIMBURSEMENT FORM

Walpole Island, R.R.3
Wallaceburg, Ontario
Canada N8A 4K9

**RE: Community Perceptions of Environmental Change and Health Risks at
Walpole Island First Nation Study**

This is to confirm that I, _____ have received an
honarium in the amount of _____ for participating in the above mentioned
study. I understand that this is a one-time payment. I understand that one meal (either
lunch or dinner) will be provided to me (up to a maximum cost of \$20.00) if I choose to
participate in a follow-up interview for this study.

Date: _____ Signature: _____

Appendix B
Study Information Sheet

LETTER OF INFORMATION

RE. Research Project Entitled: “Community Perceptions of Environmental Change and Health Risks at Walpole Island First Nation”

Date: December, 2005

Dear Participant:

My name is Christianne Stephens and I am a Ph.D. student in the Department of Anthropology at McMaster University specializing in the anthropology of health. In the coming months, I will be conducting research in your community. My study looks at community members' views on environmental issues and their perceptions of how changes in the environment might affect their health status. I am exploring this issue because very few studies have examined the way in which First Nations people think environmental change and environmental risks affect their health. The results of my study will be given to health care providers and organizations in the community to inform them of your experiences and concerns. It is my hope that the information will be used in a way which will go towards programs and initiatives that will help improve the overall quality of life of community members.

You are invited to participate in this study. This study is designed to help understand how environmental health issues affect the everyday lives of First Nations peoples. Participation in this study is open to all male and female adult Walpole Island Band members (18 years of age or older) who reside on the island.

I will be asking your opinion about the way you think your health may be affected by the environment in which you live, work and socialize with your family and friends. Interviews usually take about one hour to complete. There are no right or wrong answers. You have the right of speaking “on the record” or “off the record” during the interview. You are free to decline answering any question that makes you feel uncomfortable. You can withdraw from the interview at any time. If you choose to withdraw from the interview, you will have the choice of telling me what you'd like me to do with your information. With your permission, the interview will be tape recorded. Your consent to participate in this study will be tape recorded. If you don't want your consent to be recorded, I will record your consent in a written log. If at any time during the interview you decide you don't want your answers tape recorded, let me know and I will turn off the tape recorder and take written notes instead. If you wish, you can use your own name or request that I change your name so that you cannot be identified.

Anything that you say or do in the study will not be attributed to you personally, however, it will be attributed to the group as a whole. Anything that I find out about you that could identify you will not be published or told to anyone else, unless I get your permission. Your privacy will be respected. If you are participating in a group interview, I will ask the

other members of the group to keep what you say confidential, but cannot guarantee they will do so. The information obtained will be kept in a locked filing cabinet and be only available to the investigator. If you wish, I will provide you with a written copy of your interview and a report of my study findings.

The interviews will be held at the Nin Da Waab Jig Heritage Centre. If you would prefer to meet at another location, a meeting can be arranged at a place which best suits your preference and comfort level. You have the option of being interviewed on your own or as part of a group. Lunch or dinner and a \$50.00 honorarium will be provided to participants who are interviewed.

You are encouraged to ask questions about the project itself, or about how your information is being used. If you have any questions about the conduct of this study or your rights as a research participant, you may contact the McMaster University Research Ethics Board (MREB) by phone at (905) 525-9140 extension 23142 or by e-mail at ethicsoffice@mcmaster.ca

This letter is yours to keep.

Thank you,

Christianne Stephens, B.A. (Honors), M.A.

Ph.D. Candidate

Department of Anthropology

McMaster University, Hamilton, Canada

Appendix C
Interview Guide

Interview Guide

1. What does the word “health” mean to you? (How would you define the word health? What do you think of when you hear the word “health”?)
2. In general, compared to other women/men of your age, would you say that your health is
Better than theirs _____
Same as theirs _____
Worse than theirs _____
3. How satisfied are you with your present level of health? Would you say that you are
Very satisfied _____
Somewhat satisfied _____
Not too satisfied _____
Not at all satisfied _____
4. How do you think you can improve your level of health?
5. Do you think that you have control over your own health?
6. Do you think that there is a relationship between health and the environment (places) in which you live, work and interact?
7. Can you give me an example of how you think the two are related? How is your own health affected by the environment in which you live?
8. Do you think that you and your family are healthy?
9. What is your greatest health fear?
10. Do you think that the government should be (morally, financially) responsible for the health of First Nations people? (Is anybody else responsible?)
11. What do you think the government can do to make First Nations peoples healthier? To make your community healthier?
12. Do you think that Walpole residents are healthier or less healthy than they were in the old days?

13. What is the worst problem in your community?
14. Do you think that pollution (water pollution/ air pollution) is a problem at WIFN?
15. On a scale of 1 to 10, where would you rank the issue of water quality/
water contamination?
16. Do you feel that water pollution may have affected men's health, women's
and/or children's health in the community?
17. What kinds of contaminants have you heard about?
18. Have you heard about mercury or PCBs?
19. Where did you hear this information?
20. Do you think that other community members know about contaminants?
21. In your opinion, are the risks of contaminants are real?
22. Do you know anyone who has become sick as a result of exposure to
pollution/contaminants?
23. Do you think the water in this community is safe to drink?
24. Do you drink the local water?
25. If yes, have you ever had concerns over the safety of the community's drinking
water?
26. If no, why not? What other sources of water do you rely on?
27. Have you or anyone in your household experienced negative effects after drinking
the local water?
28. Has anyone you know experienced any negative or unpleasant effects after
drinking the local water?
29. If yes, on what occasion did they experience these effects? (year/month/season)
30. How long did the symptom(s) last?
31. Did they consult medical care? If yes, what was the diagnosis?
32. How is the water in the community treated?
33. How do you find out about chemical spills?

34. Do you drink the water after a reported chemical spill?
35. Do you trust the information that is provided on spills in the river?
36. Have you ever seen evidence of a chemical spill in the river?
37. Has the quality of the local water changed through the years?
38. If the answer is yes, how has it changed?
39. Before there was indoor plumbing, how did you/your family get water?
40. Do you allow your children to play/swim in the water? Why or why not?
41. Do you ever eat fish from the river/lake?
42. If no, why not?
43. If yes, how often would you say you and members of your household consume fish?
 - Once a month _____
 - Twice a month _____
 - Three times a month _____
 - More than four times a month _____
 - Nearly every day _____
44. Has your consumption of fish over the past year
 - increased _____
 - decreased _____
 - remained about the same _____
45. Does your decision to consume fish depend on knowing about chemical levels? If you found out that the local fish have high levels of chemicals in them, would you still eat them?
46. In your opinion, do you feel that water pollution has affected the fish, wildlife and/or plant life at Walpole?
47. Do you have any examples of the ways you think water pollution has affected fish, wildlife and/or plants in the area?

48. In your opinion, who is responsible for the pollution in your area/region?
49. Do you feel that people have the power to change the things that are going on with the environment?
50. In your opinion, what needs to be done to improve the state of the environment and the health of members of the WIFN community?
51. Do you think that better communication/education about contaminants would reduce people's risks?
52. What would be the best way to give information on contaminants and environmental health risks to people in your community?
53. Do you think that most things can be proven scientifically?
54. Do you think that science has all the answers concerning sickness and health risks?
55. Would you mind if researchers come into your community to ask questions about food and contaminants?
56. Would you be willing to participate in future studies on the risk of the WIFN community from exposure to environmental contaminants?

Appendix D

McMaster University Research Ethics Board Approval

McMaster University Research Ethics Board (MREB)
c/o Office of Research Services, MREB Secretariat, GH-306, e-mail: ethicsoffice@mcmaster.ca

**CERTIFICATE OF ETHICS CLEARANCE TO INVOLVE HUMAN
PARTICIPANTS IN RESEARCH**

Application Status: New ☒ Addendum ☐ Renewal ☐ REB File # **2005 132**

TITLE OF RESEARCH PROJECT: *Where the Waters Divide: Water Quality and Human Health at Walpole Island First Nation*

	NAME	DEPT/ADDRESS	#EXT.	E-MAIL
Faculty Investigator(s)/ Supervisor(s)	A. Herring	Anthropology	23915	herring
Student Investigator(s)	C. Stephens	Anthropology	24424	stephecv

The application in support of the above research project has been reviewed by the MREB to ensure compliance with the Tri-Council Policy Statement and the McMaster University Policies and Guidelines for Research Involving Human Participants. The following ethics certification is provided by the MREB:

The application protocol is approved as presented without questions or requests for modification.

The application protocol is approved as revised without questions or requests for modification.

The application protocol is approved subject to clarification and/or modification as appended or identified below:

COMMENTS AND CONDITIONS:

Reporting Frequency:

Annual Date:

Other:

Date: *10/11/2005*

Dr. D. Maurer, Chair, MREB: *[Signature]*

P:/ethics/reviewers/forms/certificate.frm

Following this research path has allowed me to step outside of the conventional Western scientific paradigms of environmental risk analysis to gain a broader and more contextualized understanding of how Walpole Island residents, view, understand and respond to “risk” and to advance an alternative research framework that allows for a more historicized and humanized view of environmental health concerns in the community. In so doing, I hope that this research helps to expand in a meaningful way our current understanding of the physical, emotional, mental and spiritual dimensions of what Western science has glossed as chemophobia, and furthermore, that the insights gained can serve as the stepping stones for further exploration of this topic.

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Appendix A
Interview Consent Form

Walpole Island, R.R.3
Wallaceburg, Ontario
Canada N8A 4K9

Dear _____ :

RE: Community Perceptions of Environmental Change and Health Risks at Walpole Island First Nation Study

Thank you for agreeing to participate in my study. Before I can interview you, I will need you to give me your consent to participate in the study. By giving me your consent, you acknowledge that you:

- have been given an oral and written explanation (letter of information) of the study;
- have been given the name and contact information of myself and the members of my research supervisory committee;
- understand that you can choose to take part or not to take part in the study and can stop the interview at any time;
- understand that your identity will not be revealed and all opinions you express will remain confidential;
- have been given the chance to ask questions about the study and understand that you can ask more questions at any time;
- have been informed that the information you give me will be part of my doctoral dissertation;
- have been informed that the results of my study will be given to health care providers and organizations in the community to inform them of community members' experiences and concerns.

If you understand this and agree to the information you contribute being used in this way, I would appreciate it if you would sign below and return this letter to me. I need this for my records.

If you have any questions, I would be pleased to discuss them with you.

Miigwech,

Christianne Stephens

I understand the above and consent to the information I provide to be used in the way described above.

Date: _____

Signature: _____

HONORARIUM REIMBURSEMENT FORM

Walpole Island, R.R.3
Wallaceburg, Ontario
Canada N8A 4K9

**RE: Community Perceptions of Environmental Change and Health Risks at
Walpole Island First Nation Study**

This is to confirm that I, _____ have received an
honarium in the amount of _____ for participating in the above mentioned
study. I understand that this is a one-time payment. I understand that one meal (either
lunch or dinner) will be provided to me (up to a maximum cost of \$20.00) if I choose to
participate in a follow-up interview for this study.

Date: _____ Signature: _____

Appendix B
Study Information Sheet

LETTER OF INFORMATION

RE. Research Project Entitled: “Community Perceptions of Environmental Change and Health Risks at Walpole Island First Nation”

Date: December, 2005

Dear Participant:

My name is Christianne Stephens and I am a Ph.D. student in the Department of Anthropology at McMaster University specializing in the anthropology of health. In the coming months, I will be conducting research in your community. My study looks at community members' views on environmental issues and their perceptions of how changes in the environment might affect their health status. I am exploring this issue because very few studies have examined the way in which First Nations people think environmental change and environmental risks affect their health. The results of my study will be given to health care providers and organizations in the community to inform them of your experiences and concerns. It is my hope that the information will be used in a way which will go towards programs and initiatives that will help improve the overall quality of life of community members.

You are invited to participate in this study. This study is designed to help understand how environmental health issues affect the everyday lives of First Nations peoples. Participation in this study is open to all male and female adult Walpole Island Band members (18 years of age or older) who reside on the island.

I will be asking your opinion about the way you think your health may be affected by the environment in which you live, work and socialize with your family and friends. Interviews usually take about one hour to complete. There are no right or wrong answers. You have the right of speaking “on the record” or “off the record” during the interview. You are free to decline answering any question that makes you feel uncomfortable. You can withdraw from the interview at any time. If you choose to withdraw from the interview, you will have the choice of telling me what you'd like me to do with your information. With your permission, the interview will be tape recorded. Your consent to participate in this study will be tape recorded. If you don't want your consent to be recorded, I will record your consent in a written log. If at any time during the interview you decide you don't want your answers tape recorded, let me know and I will turn off the tape recorder and take written notes instead. If you wish, you can use your own name or request that I change your name so that you cannot be identified.

Anything that you say or do in the study will not be attributed to you personally, however, it will be attributed to the group as a whole. Anything that I find out about you that could identify you will not be published or told to anyone else, unless I get your permission. Your privacy will be respected. If you are participating in a group interview, I will ask the

other members of the group to keep what you say confidential, but cannot guarantee they will do so. The information obtained will be kept in a locked filing cabinet and be only available to the investigator. If you wish, I will provide you with a written copy of your interview and a report of my study findings.

The interviews will be held at the Nin Da Waab Jig Heritage Centre. If you would prefer to meet at another location, a meeting can be arranged at a place which best suits your preference and comfort level. You have the option of being interviewed on your own or as part of a group. Lunch or dinner and a \$50.00 honorarium will be provided to participants who are interviewed.

You are encouraged to ask questions about the project itself, or about how your information is being used. If you have any questions about the conduct of this study or your rights as a research participant, you may contact the McMaster University Research Ethics Board (MREB) by phone at (905) 525-9140 extension 23142 or by e-mail at ethicsoffice@mcmaster.ca

This letter is yours to keep.

Thank you,

Christianne Stephens, B.A. (Honors), M.A.

Ph.D. Candidate

Department of Anthropology

McMaster University, Hamilton, Canada

Appendix C
Interview Guide

Interview Guide

1. What does the word “health” mean to you? (How would you define the word health? What do you think of when you hear the word “health”?)
2. In general, compared to other women/men of your age, would you say that your health is
Better than theirs _____
Same as theirs _____
Worse than theirs _____
3. How satisfied are you with your present level of health? Would you say that you are
Very satisfied _____
Somewhat satisfied _____
Not too satisfied _____
Not at all satisfied _____
4. How do you think you can improve your level of health?
5. Do you think that you have control over your own health?
6. Do you think that there is a relationship between health and the environment (places) in which you live, work and interact?
7. Can you give me an example of how you think the two are related? How is your own health affected by the environment in which you live?
8. Do you think that you and your family are healthy?
9. What is your greatest health fear?
10. Do you think that the government should be (morally, financially) responsible for the health of First Nations people? (Is anybody else responsible?)
11. What do you think the government can do to make First Nations peoples healthier? To make your community healthier?
12. Do you think that Walpole residents are healthier or less healthy than they were in the old days?

13. What is the worst problem in your community?
14. Do you think that pollution (water pollution/ air pollution) is a problem at WIFN?
15. On a scale of 1 to 10, where would you rank the issue of water quality/
water contamination?
16. Do you feel that water pollution may have affected men's health, women's
and/or children's health in the community?
17. What kinds of contaminants have you heard about?
18. Have you heard about mercury or PCBs?
19. Where did you hear this information?
20. Do you think that other community members know about contaminants?
21. In your opinion, are the risks of contaminants are real?
22. Do you know anyone who has become sick as a result of exposure to
pollution/contaminants?
23. Do you think the water in this community is safe to drink?
24. Do you drink the local water?
25. If yes, have you ever had concerns over the safety of the community's drinking
water?
26. If no, why not? What other sources of water do you rely on?
27. Have you or anyone in your household experienced negative effects after drinking
the local water?
28. Has anyone you know experienced any negative or unpleasant effects after
drinking the local water?
29. If yes, on what occasion did they experience these effects? (year/month/season)
30. How long did the symptom(s) last?
31. Did they consult medical care? If yes, what was the diagnosis?
32. How is the water in the community treated?
33. How do you find out about chemical spills?

34. Do you drink the water after a reported chemical spill?
35. Do you trust the information that is provided on spills in the river?
36. Have you ever seen evidence of a chemical spill in the river?
37. Has the quality of the local water changed through the years?
38. If the answer is yes, how has it changed?
39. Before there was indoor plumbing, how did you/your family get water?
40. Do you allow your children to play/swim in the water? Why or why not?
41. Do you ever eat fish from the river/lake?
42. If no, why not?
43. If yes, how often would you say you and members of your household consume fish?
 - Once a month _____
 - Twice a month _____
 - Three times a month _____
 - More than four times a month _____
 - Nearly every day _____
44. Has your consumption of fish over the past year
 - increased _____
 - decreased _____
 - remained about the same _____
45. Does your decision to consume fish depend on knowing about chemical levels? If you found out that the local fish have high levels of chemicals in them, would you still eat them?
46. In your opinion, do you feel that water pollution has affected the fish, wildlife and/or plant life at Walpole?
47. Do you have any examples of the ways you think water pollution has affected fish, wildlife and/or plants in the area?

48. In your opinion, who is responsible for the pollution in your area/region?
49. Do you feel that people have the power to change the things that are going on with the environment?
50. In your opinion, what needs to be done to improve the state of the environment and the health of members of the WIFN community?
51. Do you think that better communication/education about contaminants would reduce people's risks?
52. What would be the best way to give information on contaminants and environmental health risks to people in your community?
53. Do you think that most things can be proven scientifically?
54. Do you think that science has all the answers concerning sickness and health risks?
55. Would you mind if researchers come into your community to ask questions about food and contaminants?
56. Would you be willing to participate in future studies on the risk of the WIFN community from exposure to environmental contaminants?

Appendix D

McMaster University Research Ethics Board Approval

McMaster University Research Ethics Board (MREB)
c/o Office of Research Services, MREB Secretariat, GH-306, e-mail: ethicsoffice@mcmaster.ca

**CERTIFICATE OF ETHICS CLEARANCE TO INVOLVE HUMAN
PARTICIPANTS IN RESEARCH**

Application Status: New ☒ Addendum ☐ Renewal ☐ REB File # **2005 132**

TITLE OF RESEARCH PROJECT: *Where the Waters Divide: Water Quality and Human Health at Walpole Island First Nation*

	NAME	DEPT/ADDRESS	#EXT.	E-MAIL
Faculty Investigator(s)/ Supervisor(s)	A. Herring	Anthropology	23915	herring
Student Investigator(s)	C. Stephens	Anthropology	24424	stephecv

The application in support of the above research project has been reviewed by the MREB to ensure compliance with the Tri-Council Policy Statement and the McMaster University Policies and Guidelines for Research Involving Human Participants. The following ethics certification is provided by the MREB:

☐ The application protocol is approved as presented without questions or requests for modification.

☐ The application protocol is approved as revised without questions or requests for modification.

☐ The application protocol is approved subject to clarification and/or modification as appended or identified below:

COMMENTS AND CONDITIONS:

Reporting Frequency:

Annual Date:

Other:

Date: *10/11/2005*

Dr. D. Maurer, Chair, MREB: *[Signature]*

P:/ethics/reviewers/forms/certificate.fm