

2015

‘WATER IS LIFE’: EXPLORING THE  
RELATIONSHIP BETWEEN PLACE  
IDENTITY, WATER AND ADAPTIVE  
CAPACITY IN FORT RESOLUTION,  
NORTHWEST TERRITORIES, CANADA

Jennifer A. Fresque-Baxter  
Wilfrid Laurier University, fres3130@mylaurier.ca

Follow this and additional works at: <http://scholars.wlu.ca/etd>

 Part of the [Nature and Society Relations Commons](#)

---

### Recommended Citation

Fresque-Baxter, Jennifer A., "‘WATER IS LIFE’: EXPLORING THE RELATIONSHIP BETWEEN PLACE IDENTITY, WATER AND ADAPTIVE CAPACITY IN FORT RESOLUTION, NORTHWEST TERRITORIES, CANADA" (2015). *Theses and Dissertations (Comprehensive)*. 1701.  
<http://scholars.wlu.ca/etd/1701>

This Dissertation is brought to you for free and open access by Scholars Commons @ Laurier. It has been accepted for inclusion in Theses and Dissertations (Comprehensive) by an authorized administrator of Scholars Commons @ Laurier. For more information, please contact [scholarscommons@wlu.ca](mailto:scholarscommons@wlu.ca).

***'WATER IS LIFE': EXPLORING THE RELATIONSHIP BETWEEN PLACE  
IDENTITY, WATER AND ADAPTIVE CAPACITY IN FORT RESOLUTION,  
NORTHWEST TERRITORIES, CANADA***

by

Jennifer Alison Fresque-Baxter

Honours Bachelor of Recreation and Leisure Studies, Outdoor Recreation Concentration, Brock  
University, 2005

Master of Arts in Applied Health Sciences, Brock University, 2008

DISSERTATION

Submitted to the Department of Geography and Environmental Studies/Faculty of Arts

in partial fulfilment of the requirements for

Doctor of Philosophy in Geography

Wilfrid Laurier University

2014

© Jennifer Alison Fresque-Baxter 2014

## ABSTRACT

Water is recognised as a fundamental human right in Canada's Northwest Territories (NWT). However, the current and potential effects of climate change coupled with resource development pressures are leading to concerns about maintaining the health and viability of freshwater in the NWT. These intersecting multiple exposures can have far-reaching impacts for NWT residents who rely on water for cultural, spiritual, economic and social purposes. Ongoing changes (e.g., to water quantity, water quality, weather, precipitation and ice dynamics, for example) will increasingly require NWT residents to adapt, seek ways to plan for the future, identify opportunities, and moderate the effects of current and potential future change related to water.

Understanding the strategies people employ around adaptation and what shapes adaptive capacity has been a critical focus of the climate change literature, ranging from individual livelihood levels to national and international analyses. Adaptation and adaptive capacity are multi-dimensional concepts, and to date, the majority of adaptation assessment research has focused on objective dimensions of adaptation and adaptive capacity, including financial and human capital. Increasingly, calls are being made to include subjective dimensions in assessments of adaptation and adaptive capacity. Subjective dimensions are abstract, difficult to quantify, non-material and often relate to human characteristics such as perceptions, beliefs and values. Work on subjective dimensions has to date focused on perceptions of risk and capacity to adapt, but has generally been less emphasised in the climate change literature.

There is a recognized need to expand understandings of subjective dimensions to include new literatures and adopt approaches that recognize the values and lived experiences of people in a place, including how values both shape and are shaped by experiences of climate-related

change. Place identity, a concept rooted in human geography and environmental psychology, offers a novel avenue for exploring subjective dimensions of adaptation and adaptive capacity.

The purpose of this dissertation was to address the above gap in the climate change literature, by examining the potential relationships between place identity and adaptation and adaptive capacity, in the context of water resources. This dissertation employed a single, exploratory case study undertaken in collaboration with the community of Fort Resolution, a Dene-Métis community in the southern NWT, located on the shores of Great Slave Lake and near the Slave River and Slave River Delta. Water has been identified as a fundamental aspect of life in Fort Resolution, and contributes to identity and livelihoods. A qualitative data collection strategy was used, consisting of participant observation, semi-structured interviews, focus groups and participatory photography with community youth.

Results revealed a bilateral, mutually reinforcing relationship between place identity and adaptation and adaptive capacity, and one that is influenced by community-identified changes to water. In Fort Resolution, connections and identification to water and place are mediated through several core place-value themes, including connections to heritage and the past, health and wellbeing, and social connections, among others. Participants are experiencing changing water conditions that are felt to be impacting use of, and relationship to, water or places mediated by water. Common experiences of water change coalesced around community-identified changes in water quantity and flow, concerns about water quality, and changes in weather, precipitation and ice. While climate change was recognized in some cases as a driver of related changes, attribution of cause was largely linked with resource development upstream of the community.

These community-identified changes in water are impacting the place identity of residents, through impacts to places that support maintenance and function of place identity and

related place-values. Participants described impacts to rootedness, sense of belonging, self-efficacy, security and continuity of place. In response to identified changes, a series of interrelated adaptation strategies emerged at individual livelihood and collective levels. These adaptation strategies are positively and negatively shaped both by reactions to changing continuity of places that support place identity and a desire to protect such places now and in the future.

Study findings contribute to the growing body of work on subjective dimensions of adaptation and adaptive capacity, including consideration of place identity as a subjective dimension in adaptation assessments. In Fort Resolution, core dimensions of adaptation and adaptive capacity, including perceptions of capacity, equity and social capital, are in part shaped by place identity and vice versa. As such, understanding how people relate to and identify with places, and how these relationships influence adaptation and adaptive capacity, can help to identify opportunities for building place-based solutions and collective action situations to address current and future environmental change, particularly with respect to water.

## **DEDICATION**

This dissertation is dedicated to the memory of Raymond Simon (1950-2011).

*Father, grandfather, brother, uncle, steward, teacher, mentor.*

*For all of the lessons that you taught me, the stories that you told me and the laughs that we shared.*

## ACKNOWLEDGEMENTS

I am forever grateful to the many people and organizations that supported me on this journey. Firstly, I would like to acknowledge the generous funding support of the Social Sciences and Humanities Research Council (SSHRC) through the Joseph-Armand Bombardier Doctoral Canada Graduate Scholarship Program. I also wish to acknowledge project funding from the International Polar Year *Community Adaptation and Vulnerability in Arctic Regions (CAVIAR)* project, the ArcticNet *Adaptation in a Changing Arctic: Ecosystem Services, Communities and Policy* project, the Northern Scientific Training Program, and the Faculty of Graduate and Postgraduate Studies at Wilfrid Laurier University.

I am grateful for the opportunity to work with the community of Fort Resolution on this project, and am honoured to have learned from Elders, trappers, youth and many others. I wish to acknowledge and thank Deninu Kue First Nation for support in developing and undertaking this research. Thank you Chief Balsillie and Council for the guidance and support. Thank you to Rosy Bjornson and Patrick Simon for all of your guidance over the last few years – I am so grateful for everything you have done, and how much I have learned from you. Thank you to the Fort Resolution Métis Council for support and participation in this research. Thank you especially to Garry Bailey, Kara King and Trudy King for all of your insights and what you have taught me. Thank you also to the Hamlet of Fort Resolution, and especially Tausia Kaitu'u-Lal.

Many thanks to my community researchers Catherine Boucher and Velma Delorme, for all of your help in arranging and conducting interviews, developing questions, your insights and the many laughs.

Thank you to Deninu School. Most especially, thank you to Dan Summers, Fraser McTurk, Aaron Jezovit and Holly Norris for collaborating to create the photography project for

the students. Thank you to the many amazing students who took part in this research, you are inspiring.

Thank you to my adoptive family and friends in Fort Resolution for teaching me so much. Thank you Aleda, Kelsey, Kaden, Roanna, Destiny, Silas, Lennox, Dexter, Annie, Kirstin, Paul Jr, Kelly, Rosy, Mae, Peppie, Faye, Gaby, Jill, Warren, Velma, Richard, Patrick, Wilfred, Theresa, Rocky, Tendah, Scott, Tori, Tanis, Tamara, Angus, Dorothy, Smally, Herbie, Ruth, Stanley, Trudy, Angela, and many others. Thank you especially to my adoptive mom Dollie Simon for all you have done. I will never be able to find the words.

To my Advisory Committee, it has been a privilege to work with you over these last few years. My utmost gratitude to my Advisor Dr. Derek Armitage for your wisdom, patience and guidance in the research process. Your approach as an advisor, and the manner in which you interact with and support your students, is the approach I endeavour to emulate. Dr. Michael Imort, thank you for always encouraging me to think about the big picture – this is an invaluable skill. Thank you to Dr. Rob de Loë for pushing me to think critically and for many engaging, thought-provoking conversations. Dr. Johanna Wandel, thank you for sharing your experience and insights around adaptation and your ongoing encouragement throughout the process. Thank you to Dr. Jackie Dawson for your insightful comments at the end of this process, and for bringing new ideas that I hope to pursue moving forward.

Thank you to Pam Schaus for creating the maps. Thank you also to Jo-Anne Horton for witty conversations and soothing frayed nerves. To Dr. Sonia Wesche, I extend my deepest gratitude for being a mentor to me throughout my research, and through the process becoming a dear friend. Dr. Brent Wolfe and Dr. Roland Hall, thank you for your ongoing encouragement, and for what I have learned from you and your research group. I would also like to thank the



Environmental Change and Governance Group for support and friendship, many laughs and hours of ‘philosophizing’. Thanks especially to Sam Berdej, Mark Andrachuk, Blair Carter and Tom Dyck. Tom – thanks also for being a fantastic office mate and for the many inspiring conversations.

Thank you to the Department of Environment and Natural Resources, Government of the Northwest Territories for being so accommodating as I completed my doctoral studies. I am lucky to work with inspiring colleagues; thanks especially to Erin Kelly, Mary Tapsell, Meghan Beveridge, Katarina Carthew and Stephanie Yuill for all that you have done.

Thank you to many friends who have been there throughout the journey. Whether you know it or not you have all played a role in this success. Thank you Erin, Loretta, Olivia, Francis, Jodi, Andrew, Courtney, Amy, Mary, Darren, Meta, Jana, Sam, Paula, Andrea, Mamun, and many others. Thank you also to the Baxter and Dumais families, especially Lawrence and Carole Baxter, for all of your love and support, and for being such a welcoming family.

To my parents Eric and Karen Fresque – thank you for the unwavering support, love and advice and for teaching me to always work hard and with determination, and to express kindness and gratitude throughout life. Thank you to my brother Jeff for always being there. To my incredible husband Yvon – thank you for being my anchor during the storms and calm seas. I would never be here without you. Let’s go on our honeymoon now.

Finally, I wish to acknowledge the community members who took part in this research who are no longer with us. I feel privileged that I was able to listen and learn from you. Marsi Cho.

# TABLE OF CONTENTS

ABSTRACT.....	ii
DEDICATION.....	v
ACKNOWLEDGEMENTS.....	vi
LIST OF TABLES.....	xiii
LIST OF FIGURES.....	xiv
LIST OF ABBREVIATIONS.....	xv
CHAPTER 1: INTRODUCTION.....	1
1.1 Problem and Rationale for Study.....	5
1.2 Purpose and Objectives.....	10
1.3 Framing this Research.....	12
1.4 Thesis Structure.....	15
1.5 Limitations and Delimitations.....	18
CHAPTER 2: LITERATURE REVIEW.....	22
2.1 The Concept of ‘Place’ - The Theoretical Foundation.....	23
2.2 Place Identity.....	28
2.3 Adaptation and Adaptive Capacity.....	42
2.3.1 Overview of Adaptation and Adaptive Capacity Perspectives.....	42
2.3.2 Adaptation and Adaptive Capacity from a Climate Change Perspective.....	47
2.3.2.1 The Multi-Dimensionality of Adaptation and Adaptive Capacity.....	52
2.3.2.2 Frameworks and Approaches for Unpacking and Investigating Adaptation and Adaptive Capacity.....	62
2.3.2.3. Adaptation to What?.....	68
2.4 Framing the Relationships between Place Identity and Adaptation and Adaptive Capacity..	69
2.4.1 Experience and Perception of Exposure-Sensitivities.....	71
2.4.2 Adaptation Choices and Adaptive Capacity.....	73
2.5 Chapter Conclusion.....	81
CHAPTER 3: METHODOLOGY.....	83
3.1 Introduction.....	83
3.2. Philosophical Considerations.....	83
3.2.1 Constructivism as Research Paradigm.....	83
3.2.2 Conducting this Research from a Constructivist Perspective.....	86
3.3 Methodological Considerations.....	89
3.3.1 Overview of Qualitative Methodology.....	89
3.3.2 Research Strategy: The Case Study Approach.....	91

3.3.2.1 Case Description (Fort Resolution) .....	93
3.3.2.2 Ethical Considerations, Conducting Research in the North and Cross-Cultural Considerations.....	96
3.4 Conceptual Considerations - Conceptual Framework .....	98
3.5 Empirical Considerations (Methods) .....	102
3.5.1 Document and Literature Review .....	104
3.5.2 Semi-Structured Interviews .....	104
3.5.3 Focus Groups .....	109
3.5.4 Participatory Photography .....	111
3.5.5 Personal Experience/Observation .....	113
3.5.6 Data Analysis .....	115
3.5.7 Ensuring Trustworthiness .....	119
3.6 Chapter Conclusion.....	122
<b>CHAPTER 4: CONNECTIONS TO WATER AND PLACE – EXPLORING PLACE IDENTITY AND PLACE-BASED RELATIONSHIPS .....</b>	<b>124</b>
4.1 Introduction.....	124
4.2 Heritage and Connections to the Past .....	127
4.2.1 Place Identity Constructs Associated with Heritage and Connections to the Past .....	132
4.3 Health and Wellbeing .....	134
4.3.1 Place Identity Constructs Associated with Health and Wellbeing.....	141
4.4 What Water and the Land Provide.....	142
4.4.1 Place Identity Constructs Associated with What the Water and Land Provide.....	149
4.5 Social Connections.....	151
4.5.1 Place Identity Constructs Associated with Social Connections.....	155
4.6 Identity/‘Our Water’ .....	156
4.6.1 Place Identity Constructs Associated with the Theme of Identity.....	159
4.7 ‘Water is Life’ and the Importance of Respecting Water .....	160
4.7.1 Place Identity Constructs Associated with ‘Water is Life’ .....	165
4.8 Connections to Other Communities - Identification with Challenges and Solidarity .....	167
4.9 Chapter Conclusion.....	171
<b>CHAPTER 5: COMMUNITY PERSPECTIVES OF WATER CHANGE IN THE SLAVE RIVER, DELTA AND OTHER IMPORTANT COMMUNITY WATERWAYS .....</b>	<b>172</b>
5.1 Introduction.....	172
5.2 Changing Water Conditions in Important Community Waterways.....	174
5.2.1 Water Quantity, Levels and Flow .....	175

5.2.2 Water Quality.....	183
5.3.3 Weather, Precipitation and Ice.....	189
5.3 Future Projections for the Slave River, Delta, and Surrounding Regions .....	194
5.4 Comment on Information Available Via the Instrumental Record.....	197
5.5 Chapter Conclusion.....	201
<b>CHAPTER 6: IMPACTS TO PLACE IDENTITY AND RESPONSES TO WATER CHANGE</b> .....	<b>202</b>
6.1 Introduction.....	202
6.2 Impacts to Place Identity from Changing Water and Changing Place(s) .....	203
6.2.1 Impacts to Continuity, Security and Environmental Skills.....	204
6.2.2 Impacts to Rootedness and Sense of Belonging .....	214
6.2.3 Impacts to Self-Esteem and Self-Efficacy .....	219
6.3 Current Adaptation Responses and Strategies .....	222
6.3.1 Individual/Household Level Livelihood Responses .....	222
6.3.1.1 Perceptions of Capacity to Deal with Water Change.....	223
6.3.1.2 Mistrust of Water and Related Behavioural Responses.....	231
6.3.1.3 Individual Place Protective Behaviours .....	232
6.3.2 Collective Responses .....	234
6.3.2.1 Collaborative Action.....	235
6.3.2.2 Connecting People to Water: Passing on Traditional Values, Skills and Knowledge .....	243
6.3 Chapter Conclusion.....	248
<b>CHAPTER 7: DISCUSSION - THE RELATIONSHIP BETWEEN PLACE IDENTITY, WATER CHANGE, ADAPTATION AND ADAPTIVE CAPACITY</b> .....	<b>249</b>
7.1 Introduction.....	249
7.2 Examining the Linkages between Place Identity and Adaptive Capacity .....	253
7.2.1 Values, Valuing Future Livelihoods and Differing Values .....	254
7.2.2 Multiple Knowledge Systems, Culture and Learning.....	256
7.2.3 Information .....	262
7.2.4 Perceptions of Capacity and Equity .....	265
7.2.5 Social Capital and Collective Action.....	272
7.3 Chapter Conclusion.....	280
<b>CHAPTER 8: CONCLUSIONS AND RECOMMENDATIONS</b> .....	<b>283</b>
8.1 Overview of Dissertation .....	283
8.2 Revisiting Research Objectives .....	286

8.3 Research Contributions and Recommendations .....	291
8.3.1 Theoretical Contributions .....	291
8.3.2 Methodological Contributions .....	293
8.3.3 Practical Contributions.....	294
8.3.4 Future Research .....	295
8.4 Reflecting on my Personal Research Journey.....	298
8.5 Conclusion .....	299
APPENDIX A – License Agreement from John Wiley and Sons for Text Extracts in Chapter 2 .....	300
APPENDIX B – License Agreement from John Wiley and Sons for Table in Chapter 2.....	308
APPENDIX C – Ethical Consent Forms .....	316
APPENDIX D – Section of Research Pamphlet.....	322
APPENDIX E – Preliminary Findings Brochure.....	323
APPENDIX F – Sample Trip Summary Reports.....	329
APPENDIX G – Timeline of Field Work Trips and Activities .....	333
APPENDIX H – Interview Protocol.....	336
APPENDIX I – Deninu Student Photo Essays .....	342
Appendix I1 – Grade 11-12 Students.....	342
Appendix I2 – Grade 7-8 Class.....	351
REFERENCES .....	355

## LIST OF TABLES

Table 1: Place Identity Constructs .....	36
Table 2: Selected Dimensions of Adaptive Capacity from Across Disciplinary Perspectives .....	55
Table 3: Research Methods by Objective .....	103
Table 4: Summary of Interviews and Participants .....	107
Table 5: Focus Group Participant Composition.....	111
Table 6: Dimensions of Adaptation and Adaptive Capacity Reflected in Identified Adaptation Responses.....	251
Table 7: Place Identity Constructs Reflected in Identified Adaptation Responses .....	252

## LIST OF FIGURES

Figure 1: The Case Study Region, Map of SRD and proximity to Fort Resolution .....	94
Figure 2: Conceptual Framework .....	99
Figure 3: Process of Developing Participatory Photography Project .....	113
Figure 4: Emergent Constructs and the Relationship to Connections with Place/Water.....	126
Figure 5: Snowmobile Tracks on the Frozen Water, Photo by Paul Boucher Jr. ....	129
Figure 6: Photo by Shania Miersch.....	144
Figure 7: Photo by Shania Miersch.....	213
Figure 8: ‘A Moose Up River’, Photo by Morgan Unka .....	216

## **LIST OF ABBREVIATIONS**

AAMP – Akaitcho Aquatic Monitoring Program

AAROM – Aboriginal Aquatic Resource and Oceans Management

AANDC – Aboriginal Affairs and Northern Development Canada

CAVIAR – Community Adaptation and Vulnerability in Arctic Regions

DKFN – Deninu Kue First Nation

FRMC – Fort Resolution Métis Council

GNWT – Government of the Northwest Territories

GSL – Great Slave Lake

MRBB – Mackenzie River Basin Board

NWT – Northwest Territories

PAD – Peace-Athabasca Delta

SRD – Slave River Delta

SRDP – Slave River and Delta Partnership

WLU – Wilfrid Laurier University



## CHAPTER 1: INTRODUCTION

*“There is a place where the sidewalk ends  
And before the street begins,  
And there the grass grows soft and white,  
And there the sun burns crimson bright”*

-Shel Silverstein (1974, p. 64)

Shel Silverstein’s (1974) poem ‘*Where the Sidewalk Ends*’ evokes the power of place. The imagery he uses to conjure ‘place’ in the minds of readers is in equal turns magical and rich, and the manner in which he depicts ‘place’ conveys a deep sense of connection.

This poem is one I have returned to repeatedly. I first encountered Shel Silverstein’s writing as a child, and since that time this particular poem has resonated deeply within my consciousness. Reading ‘*Where the Sidewalk Ends*’ takes me back to places I have come to view as an extension of myself. It connects me to places, both past and present, that constitute the very basis of who I am. For a long time, I could not explain why this poem meant so much to me, nor could I imagine what it would come to represent. To me, looking at it now through the eyes of an academic who has spent the better part of six years thinking about place connections, the poem represents the beginning of the journey that led to this dissertation, and my exploration of the rich and nuanced relationships that people have with place.

The human connection to place can be powerful. Since time immemorial, people have been making and remaking place(s), establishing connections and setting down roots. For some, these connections and roots change often. For others, they grow and deepen over time. The experiences of place are fluid and variable, and that is part of the magic (and indeed the frustration) of studying place.

‘Space’ is empty of meaning, it is blank (Tuan, 1977). Spaces become ‘places’ when they are endowed with meaning by the individuals within it, creating ‘centers of felt value’ (Tuan, 1977, p. 4; Relph, 1976; Cresswell, 2004). But what is place? It is a term that can have many meanings, depending on the context of its use (Cresswell, 2004). It is both an everyday word, as well as an academic construct, that can have many unique characterisations (Cresswell, 2004). Agnew (1987) conceptualizes ‘place’ as consisting of three aspects that give it meaning: location, locale, and sense of place. ‘Place’ provides to foundation for a person’s existence and gives meaning to how people structure and interact with the world around them (Relph, 1976; Tuan, 1977; Cresswell, 2004). Place can imply power or ownership, such as distinguishing ‘us’ from ‘them’ or ‘my place’ from ‘your place’ (Cresswell, 2004).

In academe, the experience of connection to place is encapsulated in the term ‘sense of place’. It is conceptualized as “the subjective and emotional attachment to place” (Cresswell, 2004, p. 7), or ‘love of place’ (Tuan, 1974). Sense of place can be considered to be constructed from the relationships between “physical setting, human activities and human social and psychological processes” (Stedman, 2002, p. 562). Place identity, as a related construct, can be considered a specific subjective factor that influences, and is influenced by, people’s values and experiences. Place identity is defined as “those dimensions of the self that define an individual’s personal identity in relation to the physical environment by means of a complex pattern of conscious and unconscious ideas, beliefs, preferences, feelings, values, goals and behavioural tendencies” (Proshansky, 1978, p. 155).

Person-place relationships can contribute to well-being, providing people with a sense of belonging and security (Steele, 1981; Fullilove, 1996; DeMiglio & Williams, 2008; APA, 2010; Adger, Barrett, Brown, Marshall & O’Brien, 2013). When places change, however, people may

experience loss of well-being or happiness, which can have wide ranging social, cultural, emotional and psychological impacts (Fried, 1963; Brown & Perkins, 1992; Fullilove, 1996; Eyles & Williams, 2008; DeMiglio & Williams, 2008; de la Barre, 2009; APA, 2010).

There are many multi-dimensional place-related constructs (i.e., sense of place, place identity, place attachment, place dependence, etc.), and at present, consensus on the relationship(s) between these various constructs does not exist (Jorgensen and Stedman 2001; Stedman 2002; Pretty et al., 2003; Stedman 2003; Knez, 2005; White et al., 2008). This research adopts the perspective that place identity is an inclusive, overarching construct under which other dimensions of person-place bonds, including place attachment, fall (see Chapter Two for further discussion in this regard). As such, this dissertation draws on diverse theoretical foundations to develop an understanding of place identity, ranging from human geography to environmental psychology to health geography.

This dissertation is about the power of place. It explores what place means for who people are, and how changes to place can impact deeply held person-place bonds. One of the key questions that drove the conceptualization of this research was: what happens to people, in terms of their 'place identity', when the places they love, or are strongly connected to, are perceived to change in some way? What if changes are rapid? What role does place, and identity with place more specifically, play in shaping how people understand, experience and address current or future, real or perceived environmental change?

To develop an understanding of how place-related change impacts place identity, and what this means for people, this research draws on the concepts of adaptation and adaptive capacity. Like place identity, adaptation and adaptive capacity have diverse theoretical roots, and

have been conceptualized within many disciplines, ranging from biology/ecology to political ecology to natural resource management (Plummer & Armitage, 2010).

This research draws primarily on conceptualizations of adaptation and adaptive capacity from within the climate change perspective, though I acknowledge and draw on the common insights found across diverse literatures, particularly in reference to differing ‘dimensions’ of adaptive capacity (see both section 1.1 and Chapter Two). As Devine-Wright (2013, p. 64) explains, “climate change will alter not just the physical character of places, but also related meanings, identities and emotional bonds”. The climate change perspective was adopted in this research to define and conceptualize adaptation and adaptive capacity for several reasons: 1) use of durable, tractable, and often-cited definitions; 2) use in international assessments and policy discussions (e.g., IPCC, 2007; International Human Dimensions Programme on Global Environmental Change, 2012); 3) emphasis on participatory and community-informed, bottom-up research (Furgal & Seguin, 2006; Smit, Hovelsrud & Wandel, 2008; Keskitalo, 2008; Smit, Hovelsrud, Wandel, Andrachuk, 2010; Berkes & Armitage, 2010; see also section 1.3 below, and Chapter Two); 4) shifting focus to subjective and values-based elements of climate change (Lorenzoni et al., 2000; Grothmann & Patt, 2005; O’Brien & Wolf, 2010; Kuruppu & Liverman, 2011; Wolf, Alice & Bell, 2013; see also Section 1.3 below, and Chapter Two); 5) consideration of the intersection between climate change and other drivers (e.g., ‘multiple exposures’) (O’Brien & Leichenko, 2000; Keskitalo, 2008); and, 6) common use for framing adaptation and vulnerability assessments across multiple communities, contexts and sectors in Canada’s North, creating future opportunities for comparability (see for example, Ford & Smit, 2004; Ford, Smit & Wandel, 2006; Ford, Bell & St-Hilaire-Gravel, 2010; Berkes & Armitage 2010; Ford, Berrang-Ford, King & Furgal, 2010; Gauthier et al. 2014).

## 1.1 Problem and Rationale for Study

Adaptation generally “refers to a process, action or outcome in a system (household, community, group, sector, region, country) in order for the system to better cope with, manage or adjust to some changing condition, stress, hazard, risk or opportunity” (Smit & Wandel, 2006, p. 282). Adaptive capacity is considered as the *ability* of a system, individual or community to adapt to or recover from an exposure, to expand its coping range, moderate the effects of such changes and anticipate future occurrences (Smit & Wandel, 2006; IPCC, 2007; Keskitalo, 2008; Smit et al., 2008). Successful adaptation is shaped by adaptive capacity, as adaptive capacity represents the potential to adapt (Brooks, 2003; Smit & Wandel, 2006). Adaptive capacity is a multi-dimensional construct (Adger & Vincent, 2005; Vincent, 2007). Adaptive capacity consists of both objective and subjective dimensions, which each shape opportunities for current and potential future actions and how and why systems adapt in the ways they do (Lorenzoni et al., 2000; Grothmann & Patt, 2005; Smit & Wandel, 2006; Smit et al., 2008; Kuruppu, 2009; O’Brien & Wolf, 2010).

Much research on adaptation and adaptive capacity addresses the role of objective dimensions of current adaptation and future capacity to adapt, such as political support, financial capital, human resources and technical skills (Yohe & Tol, 2002; Grothmann & Patt, 2005). Less emphasised, however, are the subjective dimensions of adaptive capacity that also shape current adaptation and future capacity at both individual and collective levels (Lorenzoni et al., 2000; Grothmann & Patt, 2005; O’Brien & Wolf, 2010). Few authors have systematically defined the subjective dimensions of adaptive capacity (as comparable to an understanding of objective capacity). Subjective dimensions, here, are considered those dimensions of adaptation and adaptive capacity that are more abstract, difficult to quantify, non-material and often relate to

human characteristics such as perceptions, attitudes, beliefs, values and motivations. In climate change research, much of the work on subjective capacity has focused on how people perceive the climate-change related risks and impacts, as well as how individual perceive their ability or capability to adapt (Lorenzoni et al., 2000; Wester-Herber, 2004; Grothmann & Patt, 2005; Kuruppu, 2009). Examination of the role of subjective and cultural dimensions of adaptive capacity in climate change and adaptation/vulnerability research and risk assessment has been under-emphasised, and there is a need to integrate such subjective elements into climate change research (see for example, O'Brien & Wolf, 2010; Adger et al., 2013; see also Chapter Two). This need represents a research gap, and an issue I seek to address in this dissertation. 'Place' and related constructs (specifically sense of place) have been identified as important for adaptation and adaptive capacity (Beckley, Parkins & Stedman, 2002; Parkins, Varghese & Stedman, 2004; Fabricius et al., 2007; Hunter, 2008; Kofinas & Chapin, 2009; Marshall et al., 2009; Adger et al., 2013; Devine-Wright, 2013). However, a systematic, in-depth examination of the link such relationships people have with their environment and the role that these relationships play in shaping adaptation and adaptive capacity at individual and collective levels remains a gap in the current climate change literature. More research is needed to address personal experiences with changing environments and the impacts these experiences have on vulnerability and adaptation (Grothmann & Patt, 2005; Klein et al., 2007; Berger & Liverman, 2008; Relph, 2008). Understanding personal experiences with place can come through an examination of the relationships people have with place – particularly when those relationships serve as defining features of the self.

It is my position that place theories offer a lens to examine people's values and experiences in the context of environmental change, and how such values and experiences may

influence adaptation and adaptive capacity as related to potential current and future changing environmental conditions (from climate change and other drivers, as will be discussed below). This corresponds to the identified need for research that explicitly addresses the role of values in climate change adaptation (O'Brien & Wolf, 2010). The dearth of theoretical focus on the linkages between place identity, environmental change and adaptive capacity provides the theoretical rationale for this research (see Chapter Two).

While thus far, I have discussed climate change broadly, from this point forward, I am situating my dissertation within the context of water in the Northwest Territories (NWT), Canada. Water has been identified as a fundamental human right by the Government of Northwest Territories (GNWT), and in the NWT, the economic, cultural and spiritual importance of water for Aboriginal groups has been recognized (AANDC/GNWT, 2010). In the *Report on the Tu Cho International Indigenous Rights Conference* (Bianchi, 2006), water is identified as the life-giver, a powerful force that both provides for people and must in turn be respected and cared for by people.

Building on the fundamental relationship that northern residents have with water, *Northern Voices, Northern Waters: the NWT Water Stewardship Strategy* was released in 2010. This strategy was a joint initiative between the Government of the Northwest Territories and Aboriginal Affairs and Northern Development Canada (AANDC; then called Indian and Northern Affairs Canada or INAC), in collaboration with Aboriginal governments and other water stakeholders. In the early part of the 2000s, increasing pressures on water resources, primarily from upstream development in British Columbia, Alberta and Saskatchewan, were a cause for concern among NWT communities and government leadership at multiple levels (AANDC/GNWT, 2010). A series of water conferences held within the territory further

reinforced the need for a pan-territorial water strategy that focused on water stewardship and would set the direction for water decision-making in the NWT into the future (AANDC/GNWT, 2010). The dialogue that resulted from these conferences, as well as additional community engagement sessions (using multiple means), were incorporated into the draft strategy entitled *Northern Voices, Northern Waters: A Draft NWT Water Stewardship Strategy*. Community tours, meetings with Aboriginal leadership and public engagement then helped to shape and revise the Strategy into the final version that is available today. The Strategy is collaborative and was formed with considerable direction from the NWT's Aboriginal population. The Strategy provides the vision for how water should be managed in the NWT and sets a direction for how to achieve this vision.

A core component of the NWT Water Stewardship Strategy is the emphasis on the relationships that people have with water in the NWT, as well as the recognition of the need to consider water values in decision-making for water, people and aquatic ecosystems (and the linkages among these things) (AANDC/GNWT, 2010). The recognition of the importance of understanding and accounting for water-based values in planning points to a need to further elucidate the myriad ways that water values are experienced and expressed with respect to water in the NWT. Such a need provides the practical rationale for this research.

The aforementioned sources also identify the impacts that changing water conditions are having, and could have, on northern residents. Current and future changes will require northern residents to adapt, and develop and implement strategies for protection and use of water. Therefore, the NWT represents an appropriate context for exploring the link between place identity, water change and adaptive capacity.



Wesche (2009) conducted research with the community of Fort Resolution, NWT. Her work focused on adaptation to environmental change, prompted by local concerns about the impacts of climate change and resource and industrial development. This work identified a suite of objective assets that shape adaptive capacity in the community, including social cohesion, resources and trust (see also, Wesche & Armitage, 2010). Valued relationships between people and the environment were also identified (Wesche, 2009). A recommendation was made for future research to explore the role of sense of place and person-place relationships in long-term planning, in building community capacity and cohesion, and in shaping health and well-being (Wesche, 2009).

Water is important to the community of Fort Resolution, spiritually, culturally, and for subsistence and recreation activities. Water provides the means for people to travel on the land to hunt, fish and trap, activities that are important for community members. Deninu Kue First Nation (DKFN) articulated the importance of water in a presentation to the Mackenzie Valley Environmental Impact Review Board (DKFN, online, n.d.):

*For the Chipewyan of Deninu Kue, the Great Slave Lake is like a heart and all the rivers, streams and channels are like veins that supply the heart with blood.*

*If you contaminate the blood, everything begins to shut down, and soon your heart stops. This is what we see for the future of the Great Slave Lake with all the development north, south, east and west of it. (Deninu Kue First Nation in a presentation to the Mackenzie Valley Environmental Review Impact Board, n.d., online)*

I conducted two scoping trips to Fort Resolution in 2008 and 2009 to explore interest from the community in conducting a research project related to place identity, water and adaptive capacity. During these trips, the importance of water and of place-based relationships was reaffirmed, through formal and informal meetings with community leadership, Elders,

environment and resource staff from community and regional Aboriginal governments, and other community members.

This dissertation builds on this previous research and the outcomes of the two scoping trips, by focusing on relationships with place and water, and the experiences of community-identified changes in water conditions in and around the community of Fort Resolution. I conducted this research via a single, exploratory case study, using multiple methods (i.e., 49 interviews, 1 focus group, participatory photography with youth, and participant observation). The research was carried out over four field sessions (including the aforementioned scoping trips). Three additional trips were made following these field sessions, where results of the study were shared and interview information and quotations were member-checked with participants. Of my seven research visits to Fort Resolution, two trips were three months in duration, one was a month long visit, one a three week visit, two were a week long and one was three days.

Emphasis in this dissertation is on important community waterways, including the Slave River, Slave River Delta and Great Slave Lake. Additional important waterways such as Little Buffalo River and Taltson River were also identified by community members.

## **1.2 Purpose and Objectives**

The purpose of this research was to **investigate the link between place identity and adaptation and adaptive capacity, in the context of relationships with water**. The relationship between place identity, adaptation and adaptive capacity has received little attention. Therefore, this was a novel avenue for current research. Three related research objectives were established to help meet the overall goal of this research.

The first objective was to examine the extent to which individual and collective place identity in Fort Resolution was connected to water or places mediated by water, and in what ways (**Objective 1**). This objective was aimed at determining how people in the community of Fort Resolution defined their relationships with water (broadly) and the Slave River Delta (SRD) and Great Slave Lake (GSL) (specifically), at both individual (personal place identity) and collective (shared place-based values) levels.

The second objective was to identify whether people have experienced changing water conditions, if so in what ways, and whether community-identified changing water conditions had impacted the place identity of community residents (**Objective 2**). There were two associated sub-objectives. The first was to determine community-identified exposure-sensitivities, including current and future exposure-sensitivities, and how identified changes were attributed (**Sub-Objective 2a**). The second sub-objective was to examine how community members felt that identified current or potential future changes may shape their relationships with water and place(s) and the extent to which those relationships have influenced how they have perceived and dealt with change (risk perception and adaptation) (**Sub-Objective 2b**). This sub-objective was also aimed at identifying community actions and priorities for use and protection of water.

The third objective was to explore whether or not place identity may contribute to the ability of the community to cope with, address, moderate or seek opportunities in community-identified changes to water and important places (adaptive capacity) (**Objective 3**). There were two related sub-objectives. The first was to examine how place identity influences adaptive capacity at an individual livelihood scale (**Sub-Objective 3a**), through its influence on perceptions of capacity to adapt and adaptation behaviours. The second sub-objective was to examine whether or not place identity and values are collectively shared (or not shared), and to

what extent this influences collective action, social capital and trust (aspects of adaptive capacity) in a community such as Fort Resolution (**Sub-Objective 3b**).

### **1.3 Framing this Research**

This dissertation is grounded within the emerging literature on subjective adaptive capacity, which, as noted above, has been less emphasised in climate change adaptation research (e.g., Lorenzoni et al., 2000; Grothmann & Patt, 2005; Kuruppu, 2009; O'Brien & Wolf, 2010; Kuruppu & Liverman, 2011; Wolf & Moser, 2011; Adger et al, 2013; Devine-Wright, 2013). I focus specifically on exploring place identity as a possible subjective dimension of adaptation and adaptive capacity, in relation to climate change and other drivers of water change. To do this, I draw on, intersect and adapt one established framework for vulnerability and adaptation assessments, and one emerging approach. The 'Community Adaptation and Vulnerability in Arctic Regions' (CAVIAR) framework provides a structure for community-driven and informed research that explores how participants experience and perceive exposure-sensitivities, make choices about adaptation and identify those factors that shape current and future abilities to adapt (Smit et al., 2010). The values-based approach (e.g., O'Brien & Wolf, 2010; Wolf et al., 2013) takes 'values' or subjective dimensions as the starting point of analysis and examines how climate change and other drivers of change impact things that matter to people. These approaches will be expanded upon in Chapter Two, as will the ways in which they complement each other.

Adaptation to water change may take many forms, such as environmental, social or institutional adaptations in the ways in which individuals and communities use and protect their

water resources (see Chapter Seven). For example, in a case study of community capacity to address water shortages in the Upper Credit River Watershed in Ontario, Ivey, Smithers, de Loe and Kreutzwiser (2004) found that multiple adaptation strategies were employed, including public awareness efforts, natural flow supplementation, and modifying releases from reservoirs to maintain base water flows. In this dissertation, in addressing adaptation and adaptive capacity, particular emphasis is on how subjective dimensions of adaptation and adaptive capacity, through an examination of place identity, shape how a community adapts to, moderates, and identifies opportunities in changing water conditions (see Chapters Six and Seven).

The relationship between people and changing water conditions is dialectic. This means that while changing water conditions impact people's way of life and identity, people are not merely passive in the process. Rather, in some cases, individuals and communities may play a role in the changing water conditions, and as such are not merely imposed upon by change but rather active in the process. In other cases, when people are impacted by change they take on the active role of agent in addressing or modifying changes. Individuals and communities may also contribute to and inform policy development. While much of this research focuses strongly on the impacts on people and identity from changing conditions, the role of agency on the part of individuals and communities, particularly with respect to adaptive capacity (through the manner in which people choose to address changing conditions), is discussed in Chapters Six and Seven.

It is important to note that in Aboriginal communities generally, and Fort Resolution specifically, 'the environment' is approached in a holistic fashion, with all parts (from water to land, animals to people) interconnected and dependent on each other. Therefore, it is not possible to discuss or examine one aspect of the environment without considering the relationships to other aspects. However, water is often viewed as a common thread that links all parts of the

system, as all system components rely on water to function and maintain health. When people describe relationships to water, they are describing relationships to the water itself (whether generally or in a particular place) as well as how that relationship extends to the other interconnected parts of the system. When water changes, or is perceived to change, people recognize the impacts and changes on other parts of the system, such as land and animals. Water, then, is a natural entry point into examining people-place relationships, and for studying perceptions and impacts of change on those relationships. People in Fort Resolution have identified changes and impacts to water as one of their core concerns, and when engaged in discussions about impacts and changes to water, will discuss not only water itself, but how changing water affects individuals, the community, the land, the animals, the fish, and so forth.

As will be discussed in Chapter Four, people in Fort Resolution have developed relationships with water in and around the community for myriad reasons, and these relationships contribute to both individual and collective place identity. Though length of time/residency can influence certain constructs of place identity such as rootedness (see Chapter Two; see also Tuan, 1980; Hay, 1998), the length of time using or relating with a place was not a focus of this research. Rather, focus was on how community members, across diverse demographic groups, experience place identity, and experienced impacts to that identity from community-identified changing water conditions.

Change is a natural part of deltaic systems specifically (Timoney, 2007), and of aquatic ecosystems generally. Additionally, impacts from climate change and development have been identified by community members as impacting their use and interactions with water and important places. ‘Water change’ in this dissertation is defined as the changes identified by community members as posing some sort of threat or harm to the waters and places that they

love and identify strongly with. Furthermore, in this dissertation, the term ‘community-identified’ changes will be used, to underscore that the changes discussed are those identified and experienced by the community members who participated in this research, and to recognize that these changes are very real for the people who are experiencing them. People examining or interacting with the environment from different perspectives (e.g., Western scientists, outsiders, policy-makers, etc.) may agree or disagree on the changes, their cause and magnitude, and whether real or perceived; indeed, this has been a common challenge given that Western science has often been privileged over Traditional and local knowledge, particularly when different knowledges highlight different changes or ways of measuring those changes (Berkes, 2008; see also Chapter 3). Understanding how a community defines and adapts to impacts of water change – whether climate change, or in instances of double-exposure – begins with understanding how people in the community perceive, identify and experience change. In this research how participants perceive and experience change is examined through the lens of place-based identity, and the values of places that contribute to that identity. Regardless of the source or magnitude, community members who participated in this research are identifying and experiencing change that is incongruous with the values and components of places that they derive identity and sense of self from.

#### **1.4 Thesis Structure**

This thesis is organized as follows. Chapter One has introduced the problem and rationale for the research study, revealing both theoretical and practical needs for a study that investigates the link between person-place connections, environmental change (specifically here in the

context of water), and adaptive capacity. This chapter has also introduced the research purpose and objectives guiding the research, and introduced readers to the case context of Fort Resolution, NWT, the community with which this research was conducted.

Chapter Two provides the theoretical foundations for this research. The chapter first explores the concept of place broadly, starting with a review of seminal perspectives on the relationship between ‘space’ and ‘place.’ Place identity and its key attributes are then explored. The chapter then explores the concept of adaptive capacity. The conclusion of the chapter examines the connections between person-place bonds and adaptive capacity, the theoretical basis for investigation.

Chapter Three outlines the methodology and research design. The chapter first discusses the constructivist philosophical framing within which this research was designed, conducted and interpreted. The chapter then explores qualitative methodology, the methodological choice for this research. The case study research approach is then presented, including rationale for selection of case study research. In this section, case context is highlighted, as well as important considerations for, and lessons from, working in Canada’s North and in cross-cultural research contexts. Specific methods used in this study, as well as data analysis techniques, are also discussed.

Chapter Four presents data-driven findings regarding the connections that people in Fort Resolution have with water and place(s). The findings are assessed against the place identity constructs identified in Chapter Two. The experiences of place, and exact nature of those experiences vary among participants. However, many common themes emerged across the majority of experiences.



Chapter Five presents an analysis of how places considered important by people of the community of Fort Resolution are changing, particularly with respect to water conditions. Drawing on participants' experiences and perceptions of change, past, present and projected future conditions are characterized. The major sources of concern, or identified drivers of change of water conditions, are also discussed throughout this Chapter. These vary based on individual experience and perspective.

Chapter Six builds on Chapter Five, and examines the implications of changing water conditions for community members. Specifically, the focus is on how changing water resources can and do impact the relationships that people have with place(s), with emphasis on experiences of loss. The Chapter examines how place identity is being impacted by community-identified changes, and the series of interrelated responses people are employing to address these changes.

Chapter Seven explores the relationship between place identity and adaptive capacity at individual and collective levels. This Chapter specifically examines how key 'constructs' of place identity (to be discussed in Chapter Two) shape, and are shaped by, key dimensions of adaptive capacity. Discussion is framed from a values perspective, consistent with a values-based approach to adaptation assessment.

In Chapter Eight, I revisit the purpose and objectives identified in the research in light of my findings and analysis. Chapter Eight highlights the theoretical and practical contributions of this work, and identifies recommendations for future research and practice. Finally, this Chapter also addresses my reflexivity as a researcher, by acknowledging the influence that engaging in this research has had on me.

## **1.5 Limitations and Delimitations**

This research was delimited by the choice to focus in depth on one particular case study, as opposed to multiple research sites. Typically, single case studies are less generalisable than research that can be compared across multiple case sites. However, in the case of this research given the localized nature of both place identity and experiences of climate change (in concert with other drivers), multiple research sites were deemed to be both unfeasible and undesirable. A single case approach was chosen to reflect the personalized nature of place identity and the largely localized nature of how environmental changes are experienced and adapted to. Thus the case chosen was selected as an exploratory case for the purposes of this study (see Chapter Three for further details).

Two sets of interviews were conducted. For the first set of interviews conducted, which revolved around changing water resources, participants were limited to key Elders who had grown up and/or spent considerable time ‘on the land’ or ‘in the bush’ and local and regional government staff who work in the areas of water and environmental management. Given time and resource constraints, not all Elders in the community could be interviewed as part of the first set of interviews (or for the project as a whole). These individuals were selected for this part of the research for their considerable expertise (including both Traditional Knowledge and Western science) and experience with land-based activities and water management. As such, they were able to provide the best available information on the extent of water change in the considered areas. Furthermore, the Elders chosen were identified by their respective Aboriginal governments as the most appropriate Traditional Knowledge holders. Territorial and Federal government representatives were not included in this research by choice, as much of the

information on water resources from these perspectives is available via other means, including published reports, media releases and websites.

Participant selection for the second set of interviews was deliberately more open. Here, the research focused on the relationships people have with water and the impacts on these relationships from environmental change. All community members can have relationships with place and with water; such relationships are not limited by long-term experience, a subsistence-based lifestyle, or work in the water-related sector.

This study was also limited, in some cases, by language and cultural challenges. Chipewyan is the first language of many Elders interviewed as part of this research, though the majority do converse in English. As an interviewer, however, I do not speak Chipewyan, and as such this posed some challenges for conducting interviews, including possibilities for misunderstandings by both researcher and participant. To address this issue, I worked with a local interpreter (Catherine Boucher) who is fluent in Chipewyan, and was identified by DKFN. Community member Velma Delorme was also hired as a community researcher.

It is important to be cognizant of the difference between people's feelings and words about place and their relationship to it, versus their actions. People may feel or say one thing, but this may not translate into their everyday behaviours. Wolfe et al. (2007) note that in Fort Resolution, there are many challenges that can influence participation in research and monitoring, including community dynamics, economic pressures and capacity issues. For example, the Slave River and Delta Partnership (SRDP) was created in 2010 to engage in research and monitoring in the Slave watershed. The partnership includes participants from Fort Resolution. The group coalesced around the value of the Slave River and Delta, and the importance of protecting it. Stemming from these core values, participants advocate strongly for

place-protective behaviours and action. However, this desire for action does not always translate into action on the ground. Capacity, feelings of lack of program ownership and resource challenges often prevent full realization of work or the desire of community members to participate (Participant Observation, Author, 2011-2013). Furthermore, often the people who attend meetings and advocate strongly for action and protection are not the same people who carry out the work on the ground. This points to a potential disconnect between the partnership process and action, as well as potential for divergent values across the community spectrum. The above challenges all point to the complexity of human behaviour, and ultimately adaptive capacity. Place identity may inform adaptation strategies, but it is critical to be mindful of the host of other determinants that may shape individual and collective action. Throughout this dissertation, I remain mindful of this as I tease apart the relationship between place identity and adaptive capacity.

In many cases, interview participation and focus group facilitation were limited by community interest, and availability of participants. In Northern communities (as is very much the case in communities across Canada), participation was often influenced by individual work schedules (for those employed within the wage economy), commercial and subsistence harvesting schedules, participation in other local, regional, and national meetings and research, and by community events. A researcher must be cognizant that their research project is not the only activity underway, and is by no means a priority (nor should it be). As such, researchers must respect community timelines, boundaries, and be flexible when pursuing research participation. For example, many of my interviews were rescheduled when weather conditions permitted individuals access to land based activities, and research activities were changed or suspended when government or industry meetings were held, or in the event of a death in the

community. In some cases, it was not possible to reschedule interviews or community meetings because of my fixed field season. Further considerations related to working in Northern communities, and cross cultural dynamics will be explored in Chapter Three.

With respect to working with youth as part of the participatory photography component of this research (described further in Chapter Three), participation was limited to two classes at Deninu School, and only to youth who consented (and, in the case of students under the age of 16, had parental consent) to have their work included in the final research project. The choice to work with only two classes was structured by appropriate linkages to classroom curriculum, teacher interest and class availability.

## CHAPTER 2: LITERATURE REVIEW

This chapter<sup>1</sup> will explore the antecedent literature that shaped my research, including the lineages and perspectives that influence place identity and adaptive capacity, and the strands of diverse scholarship that were pulled together to inform the research design, analysis and presentation of this work.

There are three major components of this chapter. The first part of the chapter focuses on place and place identity, how the concepts of place and place identity have evolved and the different meanings place and place identity can have in everyday life. The second part of this chapter addresses the different perspectives that have shaped adaptive capacity, and draws from these perspectives to develop an operational understanding of the factors or ‘dimensions’ that shape adaptation and adaptive capacity at both individual and collective levels.

The third part of this chapter brings these two concepts (and the diverse threads of scholarship that have informed them) together to explore the potential links between place identity and adaptive capacity, by drawing on diverse literatures to frame such a link theoretically. Specifically, this section identifies the relationships (both direct and indirect) that exist between the two concepts, drawing on diverse, multi-disciplinary literatures to establish the theoretical basis for investigation.

---

<sup>1</sup> Select passages of text in this Chapter are drawn from the following paper: Fresque-Baxter, J. & Armitage, D. (2012), “Place identity and climate change adaptation: a synthesis and framework for understanding”, *Wiley Interdisciplinary Reviews: Climate Change*, 3(3), 251-266, John Wiley & Sons, Ltd. Copyright © John Wiley & Sons, Ltd., and used under license agreement (see Appendix A).

## 2.1 The Concept of 'Place' - The Theoretical Foundation

The concept of 'place' can mean many things to many people, and we use the term in many ways depending on the context (Cresswell, 2004). For some, place is a location – a physical entity on a map or where one can go to. For others place is much more abstract, and encompasses emotions and relationships with a location, idea of a location or parts of a place (Cresswell, 2004). How we define place as individuals, groups or society at large depends on the necessity of what we are trying to convey to others, and is largely context dependent.<sup>2</sup> The remainder of this section will address two key ways of defining place (Tuan, 1977 and Agnew, 1987) that inform this research.

Tuan (1977), in his seminal work on person-place relationships, *Space and Place: The Perspective of Experience*, focuses on place as being distinct from the concept of 'space'. Space is empty of meaning and can be likened to a blank canvas (Tuan, 1977). Space becomes place when it is endowed with meaning by people, creating 'centers of felt value' (Tuan, 1977, p. 4); Relph, 1976; Cresswell, 2004). To be in the world is to be in place, and being in place provides the essence for one's existence (Relph, 1976; Cresswell, 2004). It is through experiences with place, that individuals can construct their reality of living in the world, determine their worldview, beliefs and preferences about particular places (Tuan, 1977). Building on Tuan's (1977) definition, Agnew (1987) introduced three critical, defining aspects of place (see also, Cresswell, 2004):

1. place as location – meaning that place is a physical entity, is fixed temporally and spatially, and exists as a geographic locality;

---

<sup>2</sup> For a full discussion of the evolution of defining place, and the many meanings it can have, please see Cresswell (2004).

2. place as locale – where places act as “the material settings for social relations – the actual shape of place within which people conduct their lives as individuals” or as members of a group (whether defined or implicit) (Cresswell, 2004, p. 7); and,
3. sense of place – which denotes the personal, intrinsic attachments and emotional relationships that people form with places and the meanings they assign to these places which stem from such relationships.

In Agnew’s (1987) definition, many of the ways we think about and consider place in our day to day lives are considered (Cresswell, 2004), making it a holistic and well-rounded way of conceptualizing the facets that constitute the idea of ‘place.’

Both Tuan’s (1977) and Agnew’s (1987) seminal conceptualizations of place inform how I am approaching the concept in this research, in that place exists in the ways that we choose to define it. Place can be a physical entity, but spaces become places and come alive when we give them meaning and establish relationships with(in) them. It is in these places that we conceptualize, construct and define ourselves as individuals, where social rules are written and re-written and where our interactions with others take place (the setting for social relationships, *sensu* Agnew, 1987). In essence, we mediate places by the meanings that we as people (whether individual, group, society, etc.) give to them, whether implicit or explicit, positive or negative, or as insiders or outsiders (Relph, 1976; Tuan, 1977; Sibley, 1995; Cresswell, 2004). Different theoretical traditions have shaped the place-as-meaning literature, and each builds upon and utilizes in unique ways the above two conceptualizations (i.e., that places are defined by the meanings we give them and the ways in which we use them). Through an examination of the literature, three distinct approaches to place as meaningful location can be identified: the



phenomenological (or ‘humanistic’ perspective), the critical perspective, and the global linkages perspective.

As seminal pieces, both Tuan (1977) and Agnew’s (1987) conceptualizations of place and sense of place have been foundational to the contemporary discourse of ‘place’ and place-as-meaning (Cresswell, 2004). These pieces have been most foundational in the phenomenological perspective, where scholars continue to examine how and why people come to ascribe meanings to places, and what impacts and shapes those meanings. Critical scholars have called into question how places come to have meanings and who defines those meanings, and the power dynamics that shape how places are defined (e.g., Sibley, 1996; Dixon & Durrheim, 2000). In the global linkages literature, scholars recognize and discuss local meaning of place, but also discuss how ‘meanings’ can extend beyond the local, as a result of influence from a compression of space and time that has resulted from globalization and mobility (e.g., Massey, 1997). Each of the three ‘strands’ of place theory will be briefly discussed here.

The phenomenological or humanistic perspective focuses largely on how individuals experience place and the meanings that they assign to space to make it place. It is largely the domain of human geographers. This particular perspective has its roots in the conceptualization of place defined by Tuan (1977), elaborated on by Agnew (1987) and discussed by many other human geographers of the 1970s and 1980s (e.g., Relph, 1976; Buttimer & Seamon, 1980, Steele, 1981; etc.). It has provided a foundation for much of the contemporary place-related literature, including sense of place, place identity, place attachment, and dependence (as will be further discussed in Section 2.2 below).

Place, in a phenomenological sense, consists of meanings, symbols and values attributed to a particular place, as well how these are shaped by intentions and experiences with(in) place

(Relph, 1976; Tuan 1977; Stedman, 2002). Places provide the context for meeting needs and goals, through the values and meanings individuals assign to place (Tuan, 1977). When a particular place meets the needs and values of people using it, attachment can be developed or strengthened. Sense of place can also contribute to well-being, by influencing a person's mental or emotional state and providing them with a sense of belonging and security, important for overall well-being (Steele, 1981; DeMiglio & Williams, 2008). For some, however, when places change, people may deny or downplay threats, or perceive them less strongly (Twigger-Ross, Bonaiuto & Breakwell, 2003).

Critical geographers have criticized phenomenologists for emphasizing human experiences in place as apolitical, and not addressing the underlying forces of power, politics and ideologies that shape these experiences (Dixon & Durrheim, 2000). Out of these discussions, a 'critical' conceptualization of place has emerged (Cresswell, 2004). This work was largely rooted in the areas of feminist, queer and Marxist theories (Cresswell, 2004). In critical geography approaches to place, emphasis is on how power and ideologies acting outside of the individual become manifested in structures that shape place and the place-making process (Gruenewald, 2003; Cresswell, 2004). Definitions of place can be used to define who belongs in a place, and who does not, as well as what activities might be considered transgressions in a place (the 'boundaries' of place) (Sibley, 1995; Cresswell, 2004). Such boundaries are defined by social structures largely produced by a dominant group and reflect the ideals of that group. Actors within these structures can change them, but this often requires power in order to do so – which typically rests with the dominant class (Sibley, 1995; Cresswell, 2004).

In an increasingly globalized world, many geographers – both phenomenological and critical – have lamented the decreasing distinctiveness of place and the impacts of this on place

relationships (Relph, 1976; Tuan, 1977; Castree, 2003; Cresswell, 2004). Relph (1976) considered homogenization of places to result in 'inauthentic' senses of place. Tuan (1974; 1977) also suggested that modern societies could not have a true sense of place, but 'folk' and 'non-literate societies' maintained this connection because they were less linked into the global world, which is a rather contentious, and potentially offensive, perspective. While phenomenologists were concerned with increasing homogenization, they focused little on the connections and processes that linked places together (Castree, 2003)

Marxist geographers stress the 'interconnection' and 'interdependence' of places globally (Castree, 2003; Cresswell, 2004). Places are linked by flows of capital and impacted by time-space compression brought about by globalization (Cresswell, 2004). The political shaping of place and the impact of increasingly global influences has resulted in place-making practices which have become exclusionary (i.e., defining places on the basis of who and what does and does not belong) (Cresswell, 2004). Defining place becomes an act of exclusion, and rootedness becomes "a symbol of reactionary exclusivity" (Cresswell, 2004, p. 39). While recognizing the connection between local places in a global capitalist society, Marxists tended to ignore place and what makes places unique in a globalized world.

A globalized world does not mean place and intimate relationships to/with place no longer exist, but rather there may be need to reconceptualise how we think about them in contemporary terms (Castree 2003; Cresswell, 2004). Massey (1997) rethought the divide between local-global place, countering with the idea of 'open' and 'global' senses of place which are intertwined and benefit from being connected to larger global processes (Castree, 2003; Cresswell, 2004). This reframing of sense of place reflects the role of scale when thinking about person-place relationships. Ultimately, much research is now concerned with what are termed

‘translocal’ places, or uniquely defined places that are embedded within a global world and linked to other places; both uniqueness and interconnectedness are considered positive attributes of place (Castree, 2003).

In terms of my approach to defining place, I draw upon each of the perspectives, as place meaning is nuanced, and cannot be informed by experience, power or translocal linkages alone. Rather, ‘place’ emerges from all of these components, each shaping the experience for the individual in unique and context dependent ways. These framings also ebb and flow over time. For example, the importance of place-based experiences for an individual (from the phenomenological perspective) may change through time.

## **2.2 Place Identity**

Within strands of geography, as well as a number of other disciplines (e.g., social psychology, environmental psychology, leisure studies, health, etc.), scholars have focused on the relationships that people form with place(s), components of place, or ideas of place (see for example, Proshansky, 1978; Rose, 1995; Harvey, 1996; Bricker & Kerstetter, 2000; Cresswell, 2004; DeMiglio & Williams, 2008). These relationships can stem from long-term or familial/genealogical experiences, positive or negative attachments or general sense of belonging to a place. These relationships, broadly taken, can be called person-place bonds. The specific term used, and approach taken to investigation, will vary depending on the disciplinary context.

Within broader place scholarship, multi-dimensional and diverse examples of multivariate constructs have emerged, including: sense of place (Relph, 1976; Tuan, 1977; Steele, 1981), place attachment (Low & Altman, 1992; Bricker & Kerstetter, 2000; Hidalgo & Hernandez, 2001; Hernandez et al., 2007), place identity (Proshansky, 1978; Proshansky et al.,

1983; Twigger-Ross & Uzzell, 1996; Dixon & Durrheim, 2000; Chow & Healy, 2008), place dependence (Jorgensen & Stedman, 2001; Pretty et al., 2003), sense of community (Pretty et al., 2003) and rootedness (Tuan, 1980). Currently, given the multi-dimensional nature of place and place-relationships, there is no consensus on a universal relationship between the many and varied constructs identified (Jorgensen and Stedman 2001; Stedman 2002; Pretty et al., 2003; Stedman 2003; Knez, 2005; White et al., 2008). Different perspectives of relationships between constructs abound. For example, some scholars propose aspects of person-place bonds, such as identity, dependence and attachment, fall under sense of place as an overarching construct (see for example, Hay, 1998, Jorgensen & Stedman, 2001, Stedman, 2002, Stedman, 2003). Conversely, Low & Altman (1992), and Kyle, Graefe & Manning (2005) argue that place attachment is itself the main construct, and identity and dependence are part of how people form attachments to specific places. Lalli (1992) and Knez (2005) identify that attachment exists as a precursor to the development of place identity, taking a contrary stance. Some scholars use the terms place identity and place attachment in a synonymous fashion (Brown & Werner, 1985). As Hernandez et al., (2007) note, “correlations between them are always high, and it is difficult to empirically establish which link precedes the other” (p. 311).

The messy relationship and significant overlap that exists with respect to the many and varied place-related constructs has been identified across disciplines (Jorgensen and Stedman 2001; Stedman 2002; Pretty et al., 2003; Stedman 2003; White et al., 2008). Others have identified the challenges associated with theoretical and methodological confusion resulting from the lack of definitional and operational clarity (Lalli, 1992; Hidalgo & Hernandez, 2001; Stedman, 2002; Hernandez et al., 2007). Many have attempted to empirically test the difference

and relationships between variable place related constructs (e.g., Stedman, 2002; Jorgensen and Stedman 2001, Hidalgo & Hernandez, 2001; Knez, 2005; Pretty et al., 2003).

There is little conceptual agreement about the relationship between these many place-related concepts, both within and across disciplinary perspectives. Place identity, in this dissertation, is considered to be the core place-construct, for the purposes of exploring how individuals and communities define themselves in relation to a specific place, or features of place. Place identity has been described as a more inclusive term among the varied person-place relationship constructs (McAndrew, 1998), providing rationale for its focus in this dissertation. While perspectives on an inverse relationship between place identity and sense of place (i.e., where sense of place falls under place identity) have not yet been explicitly articulated, I posit that having ‘sense of place’ contributes to and shapes the experience of place identity. This dissertation draws on and utilizes the views of Lalli (1992), Twigger-Ross & Uzzell (1996), and Knez (2005), in that attachment to place is approached as a precursor or component of place identity. Hay (1998) suggests that attachment is influenced by rootedness and length of residency (see also Knez, 2005).

This dissertation thus focuses specifically on place identity. Place identity is a “compelling framework for identifying and understanding the effects of place changes on people” (De la Barre 2009, p. 6). The development of place identity as a concept has roots in early human geography (largely from place theorists, and extended to work focused on sense of place), and the early days of environmental psychology. A brief overview of the evolution and treatment of place identity as a concept is offered below, as is how place identity – a nebulous construct, with conceptualizations across diverse literatures – is considered in this dissertation.

Early phenomenological place scholars (e.g., Relph, 1976; Tuan, 1977; Buttner & Seamon, 1980) discussed identification with place in broad terms, dealing largely with affective dimensions of the concept (Proshansky et al., 1983). For example, Relph (1976) described differing degrees of ‘insideness’ and ‘outsideness’ in terms of how people relate to place(s). The highest form of insideness, ‘existential insideness’, reflects deep-rooted feelings of belonging to and in a place (Relph, 1976). Though early work in human geography did not use the term ‘place identity’, much of the work often described the importance of place(s), sense of belonging and attachment as critical for understanding the self (Proshansky et al., 1983; see for example, Relph, 1976; Tuan, 1977; Rose, 1995), which would shape later conceptualizations of the affective dimensions of place identity (discussed below).

Place identity as a term was first coined by Proshansky (1978), who, as an environmental psychologist, lamented the neglect of the physical world in theoretical understandings of the self being articulated by social psychologists and sociologists. As Proshansky (1978) noted, work in social psychology – primarily that of the Chicago School theorists – focused on how people were socialised into the world and growth and development of self-identity from social and cultural perspectives. Though Proshansky (1978) acknowledged social and cultural settings as important to development of self-identity, he also advocated for understanding how navigation and use of the physical world in day-to-day life contributed to aspects of self-identity. Place identity is thus a component of overall self-identity, and there is both a ‘global’ place identity subset, as well as place-related implications for all other sub-identities (Proshansky, 1978; Proshansky et al., 1983). Proshansky (1978, p. 155) defines place identity as “those dimensions of the self that define an individual’s personal identity in relation to the physical environment by means of a complex pattern of conscious and unconscious ideas, beliefs, preferences, feelings, values, goals

and behavioural tendencies”. This early framing is largely conceptualized from a cognitive perspective with respect to how we learn to distinguish places, features of place, and what aspects of place support who we are and maintain identity functions (see also Cuba & Hummon, 1992).

Expanding upon these early framings, Sarbin (1983) and Korpela (1989) offered additional insights into the concept of place identity. Sarbin (1983) identified the importance of place and locating oneself in the world as critical for construction and maintenance of personal narrative. For Sarbin (1983, p. 338), “place identity is construed from epistemic acts directed towards locating oneself in the geographical ecology”, and people engage in such acts to maintain congruence of their personal narrative. Considerations of ‘who I am’ are linked to understanding ‘where I am’ (Sarbin, 1983). Korpela (1989) introduced the concept of place and place identity as part of self-regulation, expanding upon Sarbin’s (1983) discussion of personal narrative. People choose environments that regulate the balance of pleasure/pain and maintain a coherent concept of self, promoting self-esteem. Continuity of place, through the maintenance of values, meanings and uses of that place, “is an important part of place identity, and places remain part of self-reference if they continue to be consistent with how individuals understand and define themselves” (Fresque-Baxter & Armitage, 2012, p. 253; see also, Proshansky et al., 1983; Korpela, 1989; Twigger-Ross & Uzzell, 1996; Hernandez et al., 2007).

In contrast to Proshansky and colleagues (1983), Korpela (1989, p. 245) identified the critical need to also consider the affective dimensions of place identity, noting that “obviously, some kind of emotional attachment to place has to be the main basis of place identity”, thus linking the affective and cognitive dimensions more concretely. Affective dimensions of place have been largely explored in relation to place attachment and sense of place (see for example,



Relph, 1976; Tuan, 1977; Williams et al., 1992; Low & Altman, 1992; Manzo & Perkins, 2006; Hernandez et al., 2007), though as noted above, in this research place attachment and sense of place are considered to be part of overall place identity. Affective dimensions of place identity focus on how attachment or love of place shape sense of belonging to and in that place (Rose, 1995; Stedman, 2002; Manzo & Perkins, 2006; Hernandez et al., 2007; Lewicka, 2008).

Meanings and values assigned to places, or developed in relation to place, influence attitudes, behaviours and feelings towards places and how people characterize their worldviews (Fresque-Baxter & Armitage, 2012). Devine-Wright (2009) describes place identity as the contribution of attributes of place, whether physical or symbolic, to a person's sense of who they are. These place meanings thus serve as an extension of the self (Pretty et al., 2006). Place identity is both enduring and evolving (Proshansky et al., 1983), meaning that specific values and meanings are stable and critical for maintaining self-reference but that through new experiences, new meanings and values can be also assimilated into existing cognitive and affective structures (Proshansky et al., 1983; Cantrill & Senecah, 2001; Twigger-Ross, Bonaiuto & Breakwell, 2003).

Social dimensions of place identity have also been articulated and explored. In Proshansky's early work (1978), he noted that there was no physical place that did not also have cultural, social and psychological influences. Places are the settings where social relationships are enacted. Place identity is both based on personal experiences in place, as well as socially constructed, whereby meanings, values and experiences are filtered, enacted and reproduced through social, political and cultural structures (Sarbin, 1983; Cuba & Hummon, 1993; Entrikin, 1996; Dixon & Durrheim, 2000; Stedman, 2002; Inhalan & Finch, 2004; Pretty et al., 2003). However, it is important to recognize that is not just the social environment that shapes people's

meanings, values and experiences in place, but that the physical environment also contributes to construction of place identity (Proshansky, 1978; Proshansky et al., 1983; Entrikin, 1996; Stedman, 2003). As such, ongoing interactions between social, personal, natural and cultural dimensions of place interact to (re)produce place identity.

Recent scholarly work has begun to focus on “group based dimensions of identification with place” (Dixon & Durrheim, 2004, p. 29) rather than the ‘individualistic’ approaches of early theorists. Place identity has both individual and collective components (Pretty et al., 2003). Twigger-Ross and Uzzell (1996) state that group membership is often defined through use of, or residence in, a specific location. This membership is defined by how individuals perceive themselves and groups as either belonging to or excluded from a specific place, relating to the above idea of ‘insideness’ (Castree, 2004; Dixon & Durrheim, 2000; Relph, 1976). Furthermore, the development of symbols, meanings and language to describe place is often the result of socialization processes; therefore, people within a common societal framework will often have similar ways of interpreting place (Relph, 1976). While recognizing that culture and society play a strong role in shaping our interpretation of the environments we engage with, Tuan (1977) suggests that certain types of place experiences have transcendental qualities that are beyond just cultural influence. The discursive nature of place identity – how power and equity structures that shape how identity is enacted, whose identity is legible in a place, and how identity can be used as a tool of defining who and what belongs (or does not belong) in a place – has also been considered (Rose, 1995; Dixon & Durrheim, 2000).

Finally, work has also recently begun to explore the behavioural dimensions of person-place relationships, including place identity. Cognitive, affective and social dimensions of place identity can all shape how people behave in a place and react when places change. For example,

how we think about, feel towards and value a place influences how we use and perform in that place, and how we expect other people should use and perform in that place (Proshansky et al., 1983; Twigger-Ross & Uzzell, 1996; Dixon & Durrheim, 2000). Thus, behaviour in place is structured by our identification with that place. Furthermore, impacts to place may result in people taking action to protect place in efforts to maintain congruence to identity (Stedman, 2002; Twigger-Ross et al., 2003; Devine-Wright, 2009), as will be further discussed later in this chapter.

Multi-disciplinary approaches to place are beginning to gain traction (Gruenewald, 2003; Castree, 2004). Proponents of this view argue that place “should not constitute a single research tradition” (Patterson & Williams, 2005, p. 362). In this dissertation, place identity is approached as an integrative concept with cognitive, affective, behavioural, and social dimensions, especially given that these dimensions are not mutually exclusive, and interact to shape and reinforce each other. This holistic and integrative framing of place identity draws on insights from across diverse literatures, and reflects the evolution of the concept from its early roots in human geography and environmental psychology. I characterize place identity as the cognitions, meanings, values and attitudes associated with a place, shaped by an iterative process of interacting with that place. This ongoing interaction with place, features of place and people in place, creates a sense of belonging to that place that shapes how an individual defines themselves. It is both an experiential and socially constructed phenomenon. Table 1 unpacks place identity sub-constructs gleaned from diverse literatures, summarizing and building on the above dimensions. The experience or ‘presence’ of each is context-specific, varying depending on the nature of the individual or community, and the temporal, spatial and social contexts within which ‘place’ is experienced. These constructs are used to frame the analysis in this research.

**Table 1: Place Identity Constructs**

CONSTRUCT	OPERATIONAL DEFINITION	SELECTED REFERENCES
Emotional Attachment	<ul style="list-style-type: none"> <li>• Can be both positive or negative</li> <li>• Attachment to specific places or features of place</li> <li>• Relationship to a place leads to emotional bonding with that place</li> <li>• Place as ‘a repository for emotions’ (Williams &amp; Vaske, 2003)</li> <li>• The degree of attachment will vary from person to person</li> <li>• Related to satisfaction, can result in fostering creativity, providing security and serenity</li> </ul>	Chow & Healy, 2008; Lewicka, 2008; Williams & Vaske, 2003; Twigger-Ross & Uzell, 1996; Korpela, 1989; Proshansky et al., 1983
Environmental Skills	<ul style="list-style-type: none"> <li>• The ability to use a specific place to meet the needs and desires of the individual which is congruent with how they define that place as important to their self-understanding</li> <li>• Contributes to and helps define the level of attachment to a place and the level to which the place is part of individual self-definition</li> <li>• Consists of:               <ol style="list-style-type: none"> <li>1. Competence: is the ability to use and behave within an environment based on one’s understanding of that environment (how to navigate physical features or interact with other people in a place)</li> <li>2. Understanding: represents awareness of the environment, ability to read environmental cues in the landscape and interpret these, the ability to recognize change and what this means to the individual and understanding of how to change individual or group behaviour as necessary to the environment in question</li> <li>3. Control: represents actual skills or ability to change the behaviour of oneself or others, or the actual setting</li> </ol> </li> </ul>	Proshansky et al., 1983
Self-Esteem	<ul style="list-style-type: none"> <li>• Reflection of a person’s opinion of their own self-worth</li> <li>• Being associated with a certain place can give a person feelings of self-worth and belonging</li> <li>• Certain environments support self-esteem</li> </ul>	Devine-Wright, 2009; Wester-Herber, 2004; Horwitz et al., 2001; Twigger-Ross & Uzell, 1996; Lalli, 1992

CONSTRUCT	OPERATIONAL DEFINITION	SELECTED REFERENCES
Self-Efficacy	<ul style="list-style-type: none"> <li>• Person’s perception of their own ability to undertake certain tasks and meet particular goals</li> <li>• An environment that meets the needs of an individual using it can contribute to positive feelings of self-efficacy</li> <li>• Understanding of environment is important for daily activity</li> <li>• When an environment is unmanageable, self-efficacy is threatened</li> </ul>	Knez, 2005; Wester-Herber, 2004; Dixon & Durrheim, 2000
Continuity	<ul style="list-style-type: none"> <li>• “the desire to preserve continuity of the self-concept” (Twigger-Ross &amp; Uzzell, 1996, p. 207)</li> <li>• Places remain continuous and provide same attributes and meet certain needs, giving continuity to identity</li> <li>• This can be subdivided into place-referent continuity and place-congruent continuity. <ul style="list-style-type: none"> <li>○ Place-referent continuity: “places act as references” and “maintenance of a link to that place provides a sense of continuity to [a person’s] identity” (Twigger-Ross &amp; Uzzell, 1996, p. 207) <ul style="list-style-type: none"> <li>▪ Exists at both individual and group levels</li> <li>▪ Importance of maintaining control over changes to continuity</li> </ul> </li> <li>○ Place-congruent continuity: attachment and maintenance of ‘characteristics’ of places <ul style="list-style-type: none"> <li>▪ Importance of types of features</li> <li>▪ These can be transferred from place to place and carried with a person</li> </ul> </li> </ul> </li> </ul>	Knez, 2005; Wester-Herber, 2004; Twigger-Ross & Uzell, 1996; Lalli, 1992; Korpela, 1989
Distinctiveness	<p>Exists in two ways:</p> <ul style="list-style-type: none"> <li>• place itself is distinct from other places, and is valued for this purpose</li> <li>• Being from a specific place creates a distinct identity that individuals use in distinguishing self from others, there is a sense of uniqueness in being from that place and a desire to maintain this</li> </ul>	Wester-Herber, 2004; Twigger-Ross & Uzell, 1996; Lalli, 1992
Security	<ul style="list-style-type: none"> <li>• People feel safe and secure in a place, whether physically, emotionally or psychologically</li> <li>• Feeling of being able to be oneself and feeling able to carry out everyday activities free from (relative) harm and risk (of varying types)</li> <li>• Having freedom to express oneself</li> <li>• Relationships to place are an important source of security</li> </ul>	Horwitz et al., 2001; Lalli, 1992; Relph, 1976

CONSTRUCT	OPERATIONAL DEFINITION	SELECTED REFERENCES
Sense of belonging	<ul style="list-style-type: none"> <li>• People feel that they belong to and/or in a place</li> <li>• A sense of ‘insiderness,’ can exist in varying degrees</li> <li>• Can also reflect power relationships, through defining/determining who belongs in a place and who does not</li> </ul>	Horwitz et al., 2001; Dixon & Durrheim, 2000; Cuba & Hummon, 1993; Relph, 1976
Rootedness	<ul style="list-style-type: none"> <li>• An unself-conscious state of being at home in a place</li> <li>• Reflects a deep attachment to place</li> <li>• Results from living in one place for a long term periods</li> <li>• Feeling at home, secure, comfortable in one particular place</li> <li>• Concept of ‘existential insiderness’, of belonging to and identifying completely with a place (Relph, 1976, p. 55)</li> <li>• ‘a mood or feeling’ (Tuan, 1980, p. 5)</li> <li>• People may feel homesickness or grief when away or relocated from a home place</li> </ul>	Hay, 1998; McAndrew, 1998; Tuan, 1980; Relph, 1976; Fried, 1963
Familiarity	<ul style="list-style-type: none"> <li>• Result of daily experiences in place and knowing and being known in a place</li> <li>• Familiarity can be part of existential insiderness, and can shape environmental understanding (ties to the concept of environmental skills above)</li> </ul>	Horwitz, et al., 2001; Lalli, 1992; Korpela, 1989; Relph, 1976
Social connections	<ul style="list-style-type: none"> <li>• Places are setting where social activities take place, particular social roles are also carried out in place(s)</li> <li>• Membership to a social group may be defined by use of/residence in a particular place, may also serve to define who does not belong in-place</li> <li>• Connections to others in-place can help strengthen relationship/attachment to that place</li> <li>• Can foster sense of community</li> <li>• Social identity can be communicated through place(s)</li> <li>• We experience the social meanings of places held by others, these function to shape reality</li> <li>• “there is no physical environment that is not also a social environment” (Proshansky et al., 1983)</li> </ul>	Dixon & Durrheim, 2000; Kaltenborn, 1998; Twigger-Ross & Uzell, 1996; Cuba & Hummon, 1993; Proshansky et al., 1983
Commitment to place	<ul style="list-style-type: none"> <li>• Tied to future perceptions, expectations and goals</li> <li>• Wanting to stay in a particular place</li> </ul>	DeMiglio & Williams, 2008;

CONSTRUCT	OPERATIONAL DEFINITION	SELECTED REFERENCES
	<ul style="list-style-type: none"> <li>• Important for identity stability</li> <li>• Strong place attachment is often linked to being willing to take action to protect place, low satisfaction with place conditions also influence this type of behaviour, and is often coupled with strong place attachment (Stedman, 2002)</li> </ul>	Stedman, 2002; Lalli, 1992
Aesthetic/ Experiential Value	<ul style="list-style-type: none"> <li>• Reflects individual preferences</li> <li>• Valuing qualities of a place</li> <li>• People value places for certain aesthetic components (e.g., beauty, nature, architectural structure) and experiences (e.g., quiet, social activities, pleasure, freedom of expression)</li> <li>• People can also associate places with negative aesthetic values or experiences, which can influence place identity</li> </ul>	Droseltis & Vignoles, 2010; Horwitz, et al., 2001; Dixon & Durrheim, 2000; Kaltenborn, 1998; Twigger-Ross & Uzell, 1996; Cuba & Hummon, 1993

*Adapted from Fresque-Baxter, J. & Armitage, D. (2012), "Place identity and climate change adaptation: a synthesis and framework for understanding", Wiley Interdisciplinary Reviews: Climate Change, 3(3), 251-266, John Wiley & Sons, Ltd. Copyright © John Wiley & Sons, Ltd., and used under license agreement (see Appendix B).*

A critical aspect of place identity is the assignment of meaning and value to places (whether negative or positive), and how these meanings and values shape ongoing construction and maintenance of self-concept. As noted above, people assign meanings to places as a result of ongoing interactions with that place, structured by experiences in place and shaped by social and cultural constructs (Proshansky, 1978; Proshansky et al., 1983; Sarbin, 1983; Korpela, 1989; Cuba & Hummon, 1993; Entrikin, 1996; Dixon & Durrheim, 2000; Stedman, 2002; Stedman, 2003; Ingham & Finch, 2004; Pretty et al., 2003; Hernandez et al., 2007). The meanings and values, if they are maintained and continuous, serve to reinforce sense of self (Twigger-Ross & Uzzell, 1996; Pretty et al., 2003). Often, people identify strongly with places that they love or cherish or that are important in their growth, and these places serve as an anchor for identity. As such, values (and how they are constructed and assigned to a place, and serve to mediate ongoing identity with that place) are critical for place identity.

Core to understanding place identity is understanding how changes to place impact the deeply rooted self-conceptions people create. Most place identity scholars note that construction and maintenance of place identity occurs through both conscious and unconscious processes (Proshansky et al., 1983; Korpela, 1989), but that these processes often remain latent until a place – or the values and meanings of a place – is disrupted in some way (Proshansky et al., 1983; Brown & Perkins, 1992; Devine-Wright, 2009). As such, disruptions to place – whether real or perceived – can have significant implications for cognitive, affective, social and behavioural dimensions of place identity. Changes to place can threaten continuity, which can threaten maintenance of place identity, resulting in potential employment of coping strategies to alleviate tension associated with threatened self-reference (Twigger-Ross et al., 2003; Devine-Wright, 2009).



Disruptions to place can result in feelings of loss, experiences of alienation and grief, or changes to perceptions of meanings and values associated with place (Fried, 1963; Brown & Perkins, 1992; Fullilove, 1996; Twigger-Ross et al., 2003; DeMiglio & Williams, 2008; Devine-Wright, 2009). Some people, when valued places are threatened, may downplay or deny the threat (Twigger-Ross et al., 2003). In other cases, strongly place-attached or place identified people may perceive change more substantively in places that they value (Kaltenborn, 1998; Wester-Herber, 2004). How people feel about a place can also influence how people determine what types of adaptation options are acceptable (Cheng et al., 2003; Davenport & Anderson, 2005; Manzo & Perkins, 2006). People may choose to engage in what Stedman (2002, p. 577) calls ‘place-protective behaviours’ given that “we are willing to fight for places that are more central to our identities and that we perceive as being in less-than-optimal condition”. Stedman (2002) and Devine-Wright (2009) note that place-protective behaviours can include a variety of responses, including, but not limited to, voting for changes to laws or joining protect/activist groups.

It is the outcomes of place disruption on place identity, and the strategies (or lack thereof, as the case may be) that people choose to employ to deal with that disruption that provides the space for exploring the relationship between place identity and adaptive capacity. The theoretical basis for this relationship will be discussed further in Section 2.4. First, I turn to unpacking and conceptualizing concepts of adaptation and adaptive capacity.

## **2.3 Adaptation and Adaptive Capacity**

Adaptation and adaptive capacity are broad and multi-faceted concepts that have been used in a wide range of disciplines, and the ways they have been used can be broadly captured under three disciplinary themes: natural science and biology, social science (which includes cultural ecology) and resource studies (including political ecology, risks and hazards, climate change and resilience literatures) (Plummer & Armitage, 2010). This section will provide a brief overview of the differing approaches to adaptation and adaptive capacity, and a discussion of adaptation and adaptive capacity from a climate change perspective (the approach adopted in this research).

### ***2.3.1 Overview of Adaptation and Adaptive Capacity Perspectives***

Adaptation has its origins in natural science fields, where it has largely been linked to concepts of biology and evolution (Smithers & Smit, 1997; Smit & Wandel, 2006; Sutton & Anderson, 2009). Adaptation “broadly refers to the development of genetic or behavioural characteristics which enable organisms or systems to cope with environmental changes in order to survive and reproduce” (Smit & Wandel, 2006; p. 283). While such an approach captures the biological basis for changes within organisms, it does not account for the complexities of humanity and experiences beyond the physical – not all adaptations need be rooted in genetic or behavioural characteristics. Humans, in addition to our biological mechanisms, also have cultural strategies to deal with changing environments (Sutton & Anderson, 2009).

The concept of adaptation in cultural ecology, often traced back to Julian Steward’s theory of multilineal cultural evolution, is related to how cultural groups mediate environmental

changes, and as such, how societies and cultures continued to evolve over time in the face of ever-changing environments (Smit & Wandel, 2006; Sutton & Anderson, 2009; Plummer & Armitage, 2010). Steward (1955) had three key arguments related to cultural evolution and how cultures adapt to environmental changes, as described and summarized by Sutton & Anderson (2009, p. 22):

- “(1) cultures in similar environments may have similar adaptations;
- (2) all adaptations are short lived and are constantly adjusting to changing environments;
- and,
- (3) changes in culture can elaborate existing culture or result in entirely new ones”.

In cultural ecology, groups that have ‘adaptability’ (often used interchangeably with adaptive capacity) are able to employ methods to respond to change effectively and therefore more able to adapt and survive (Smit & Wandel, 2006; Plummer & Armitage, 2010). Responses that fall within the range of cultural adaptive strategies include technology and shifting social, political and economic organization; these often evolve as responses, but can also shape future adaptation through potentially increasing the available options (Sutton & Anderson, 2009). Cultural adaptation mechanisms typically happen in a shorter time period and are more flexible than biological adaptations (Sutton & Anderson, 2009).

Concepts of adaptation and adaptive capacity are also prevalent within resource and environmental studies, and have been applied in myriad ways within this perspective (Plummer & Armitage, 2010). This includes approaches that draw on political ecology, risks and hazards, climate change and resilience thinking perspectives. Within resource studies, approaches to adaptive capacity are intimately linked with concepts of vulnerability, although the ways and

degree of this relationship varies across the different approaches. As such, discussion of vulnerability is contained within the next sections.

Adaptation has roots in political ecology literature (including various strands of entitlements research) (Smit & Wandel, 2006; Smithers & Smit, 1997; Plummer & Armitage, 2010). Adaptation components are identified both explicitly and implicitly and typically focus on access, entitlements and broader forces in shaping the ability of people to deal with or cope with environmental and socioeconomic changes. In the political ecology perspective, vulnerability and adaptive capacity are often linked with food security and the necessary entitlements and access that shape that security (Adger, 2006).

In the political ecology perspective, vulnerability and its relationship to adaptive capacity is a critical component. Vulnerability is shaped by social differentiation which influences both the cause and the outcomes of vulnerability (Adger, 2006). Adaptive capacity is shaped by the ability of individuals or groups to gain access to or mobilize resources (entitlements), which is often influenced by societal standing and other social factors (e.g., class, gender, poverty, etc.) which shape ability to access those resources (Ribot, 1996; Olmos, 2001; Adger, 2006). Those who have greater access to resources will be typically less vulnerable or more able to adapt in the face of change.

In the natural hazards stream, ability to cope with risks and perturbations is seen as the result of perceptions and adjustments to such threats (Smit & Wandel, 2006). Vulnerability (and in turn dealing with or reducing vulnerability through building of adaptive capacity) is shaped by risk to particular stressors which is influenced by the amount of exposure and sensitivity to such risks (though these are sometimes called other things, including impact and probability) (Adger, 2006). The degree of exposure and sensitivity are seen as being a function of magnitude,

frequency, duration and spatial extent (Burton et al., 1978). Risk increases with the likelihood of being exposed to a particular hazard as well as the sensitivity of an individual or group to that hazard (Adger, 2006). Risk, likelihood of exposure and sensitivity are often shaped by social factors such as class, gender and access to resources; different hazards will differentially impact different sectors of society (Adger, 2006).

Within the hazards perspective, actions that reduce the risk of being exposed to a particular threat or the likelihood of being impacted by it reduce the vulnerability of an individual which in turn strengthens overall well-being (Adger, 2006). Much emphasis in this particular stream has been on engineering-type fixes for adaptation (Adger, 2006) – including infrastructure (e.g., flood walls) and relocation of people out of hazard-prone areas – though such fixes may fail to address the root cause of vulnerability (Adger, 2006).

Adaptive capacity has also received treatment in the resilience and social-ecological systems literatures (Smithers & Smit, 1997; Smit & Wandel, 2006; Plummer & Armitage, 2010). Resilience of a system (including both ecological and social resilience) is “the capacity of an ecosystem to tolerate disturbance without collapsing into a qualitatively different state that is controlled by a different set of processes. A resilient ecosystem can withstand shocks and rebuild itself when necessary” (Resilience Alliance, 2002, online; Holling & Gunderson, 2002; Walker & Salt, 2006; Plummer & Armitage, 2010). There are three defining characteristics of resilience in coupled social-ecological systems: 1) how much change a system can withstand and still retain similar organization, structure and function; 2) the ability of a system to self-organize and the degree to which it is capable of this; and, 3) opportunities and ability for building or increasing learning and adaptive capacity of the system (Resilience Alliance, 2002; online).

Resilience approaches emphasise the linking between social and ecological systems, are predicated on and recognize the inevitability and uncertainty of change (be it ecological, social, political, etc.), and embrace the emergent opportunities that come with such change (Walker & Salt, 2006). Disregarding opportunities for change and attempts to maintain systems within arbitrary steady states can serve to increase vulnerability within the system (Walker & Salt, 2006).

Within this approach, Walker (2002, p. 14) defines adaptive capacity as “an aspect of resilience that reflects learning, flexibility to experiment and adopt novel solutions, and development of generalized responses to broad classes of challenges.” According to Plummer and Armitage (2010), adaptive capacity consists of a balance between sustaining a system and development of a system, and how resources are used as prerequisites for adaptation. Learning processes and multiple knowledge systems, modularity (degree of connectedness between components within the system), nurturing of diversity, flexibility and willingness to experiment and be innovative are key features that promote resilience within social-ecological systems (Holling & Gunderson, 2002; Walker & Salt, 2006; Plummer & Armitage, 2010).

This section provided a brief overview of the varying conceptions of the concepts of vulnerability, adaptation and adaptive capacity. In the next section, I will outline the climate change perspective, which is adopted in this research. This section was intended to provide background on differing treatments of these ideas and how they have evolved through different disciplinary perspectives. Though as Plummer and Armitage (2010) note, conceptualizations of adaptive capacity did not develop in an isolated fashion. Each approach is defined by different disciplinary traditions, starting points and approaches to the concepts of vulnerability and adaptive capacity, however there is clearly overlap between the many approaches, particularly

with respect to the forces or factors that shape vulnerability and adaptive capacity (‘dimensions’). So while I have situated by research within a climate change perspective, I acknowledge and draw on different dimensions of adaptation and adaptive capacity from the above conceptualizations (discussed in the subsequent section).

### ***2.3.2 Adaptation and Adaptive Capacity from a Climate Change Perspective***

Conceptualizations of adaptation and adaptive capacity have also been articulated within the climate change perspective. This literature has largely focused on what shapes the vulnerability and adaptive capacity of a particular unit of analysis (i.e., individual, group, region, nation, etc.) with respect to impacts of changing climate. It is within this perspective that I ground this dissertation; however, as noted below, I also draw on insights from the above-identified perspectives with respect to understanding dimensions of adaptive capacity. As identified in Chapter One, this particular approach was selected for many reasons, including its use of durable, tractable, and often-cited definitions; an emphasis on participatory and community-informed, bottom-up research (Furgal & Seguin, 2006; Smit, Hovelsrud & Wandel, 2008; Keskitalo, 2008; Smit, Hovelsrud, Wandel, Andrachuk, 2010; Berkes & Armitage, 2010); its attention to subjective and values-based elements of climate change (Lorenzoni et al., 2000; Grothmann & Patt, 2005; O’Brien & Wolf, 2010; Kuruppu & Liverman, 2011; Wolf, Allice & Bell, 2013; see also Section 1.3 below, and Chapter Two); and its consideration of the intersection between climate change and other drivers (e.g., ‘multiple exposures’) (O’Brien & Leichenko, 2000; Keskitalo, 2008).

As noted in Chapter One, within this particular perspective, adaptation “refers to a process, action or outcome in a system (household, community, group, sector, region, country) in

order for the system to better cope with, manage or adjust to some changing condition, stress, hazard, risk or opportunity” (Smit & Wandel, 2006, p. 282). Adaptation occurs when something must change in order to meet the circumstances of a changing environment, whether physical, social, cultural, etc. There is importance in maximizing opportunities in the face of change, while simultaneously seeking to minimize the effects of risk and exposure (Ford et al., 2008).

Adaptation may be proactive/anticipatory or reactive, and may be engaged in autonomously or collectively (Smithers & Smit, 1997; Fankhauser, Smith, & Tol, 1999; Berrang-Ford, Ford & Paterson, 2011). Berkhout, Hertin and Gann (2006) suggest that adaptation occurs as a reaction to the current situation while simultaneously anticipating the future.

Conceptualizing adaptation is often dependent on understandings of vulnerability, particularly who/what is vulnerable, what they are vulnerable to, and in what ways (how vulnerability is shaped) (Ford & Smit, 2004). Much like the political ecology perspective, vulnerability is a pertinent concept in the climate change perspective. The most used definition comes from the IPCC, which considers vulnerability as “the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity” (IPCC TAR, 2001b; as cited in IPCC AR4, 2007).

While climate change is a global phenomenon, the impacts of such change are felt locally (Paavola & Adger, 2006). Additionally, there are some individuals or groups who will be less impacted by climate change or will reap certain benefits out of opportunities stemming from a changing climate (‘winners’), while there will be others who are negatively impacted by the effects of change and disproportionately impacted (‘losers’) (O’Brien & Leichenko, 2003; Adger



et al., 2003). Studies within the climate change literature are largely concerned with identifying the ranges of coping, and identifying mechanisms within which to expand the range of coping.

Like many of the other resource-focused approaches identified above, ability to deal with and adapt to environmental change is framed by access to resources, capacity and social factors such as poverty, marginalization and political forces (among others). Furthermore, the disproportionate effects of climate change will often exacerbate existing inequalities and may further increase vulnerability and decrease adaptive capacity for certain people (O'Brien & Leichenko, 2003; Adger et al., 2003). Many groups are subject to what is termed 'double-exposure', where they are adversely impacted by the effects of both climate change and globalization and the synergies that exist between these two intersecting forces of change (O'Brien & Leichenko, 2000). Thus, this particular perspective accounts for not only impacts from climate change but other drivers of change as well.

The above IPCC definition has been criticized for absence of social dimensions of vulnerability (IPCC, 2007; O'Brien et al., 2004). As such, vulnerability is increasingly recognized as context- and scale-dependent, and a robust assessment should account for both the biophysical aspects of vulnerability, as well as the social determinants (IPCC, 2007; Smit & Wandel, 2006). Also increasingly recognized is that understandings and diagnoses of vulnerability are shaped by the interpretation of the assessor: 'end point' vulnerability approaches are based on future projections and posit that vulnerability is defined by "residual consequences that remain after adaptation has taken place", while 'starting point' vulnerability are focuses on contemporary experiences, with vulnerability representing "present inability to cope with external pressures or changes" (O'Brien et al., 2004, p. 2).

Facilitating adaptation, and reducing vulnerability depends on understanding and characterizing the ability or capacity of a system to address current and future environmental changes (Ford & Smit, 2004; Smit et al., 2010), as adaptive capacity represents the potential to adapt (Brooks, 2003). The ability of a system to adapt successfully is mediated through that system's adaptive capacity (Smit & Wandel, 2006). Individuals, communities, regions – whatever unit of analysis is being examined – have a range of variability within which they can cope with environmental changes (Smit & Wandel, 2006). According to Smit & Wandel (2006, p. 287), within this range of variability is the set of conditions that people can cope with, and “[m]ost communities and sectors can cope with (or adapt to) normal climatic conditions and moderate deviations from the norm, but exposures involving extreme events that may lie outside the coping range, or may exceed the adaptive capacity of the community” (Smit & Wandel, 2006, p. 287). Individuals/systems with higher vulnerability will have narrower coping ranges. Adaptive capacity, therefore, becomes the means by which this range of variability can be expanded (Smit & Wandel, 2006; Adger, 2006). Adaptive capacity, within this perspective, is considered as the ability of a system, individual or community to adapt to or recover from an exposure to climatic stimuli, to expand its coping range, moderate the effects of such changes and anticipate future occurrences (Lorenzoni et al., 2000; Grothmann & Patt, 2005; Smit & Wandel, 2006; Smit et al., 2008; Kuruppu, 2009; O'Brien & Wolf, 2010).

Exposure-sensitivities and vulnerability to particular climate risks will vary depending on temporal and spatial scales (Vincent, 2007; IPCC, 2007). Adaptation takes place at multiple scales, from local to regional to national, and adaptive capacity is likewise variable across scales (Adger & Vincent, 2005; IPCC, 2001). It is important to consider scale when discussing adaptation and adaptive capacity, as the IPCC (2001, p. 902) notes, “because the vulnerabilities

of climate change occur at various scales, successful adaptation will depend on actions taken at a number of levels”. As such, it is necessary to consider how adaptive capacity manifests at multiple scales, and the relationships and linkages that exist cross-scale to appropriately characterize experiences and identify opportunities (Adger et al., 2005).

The resources or assets available for adaptation, and those dimensions that might shape adaptive capacity, will typically vary across scales, as can the need to adapt (Adger et al., 2005; Adger & Vincent, 2005; Vincent, 2007). At the national level, resources/assets may include economic stability, levels of corruption and risk-spreading mechanisms (Adger & Vincent, 2007). At the level of the household, adaptation may reflect a particular actor’s ability to identify new livelihood opportunities in anticipation of environmental change (Vincent, 2007). Individual and household level assessments focus on the choices people make around adaptation, and what shapes those choices (Adger & Vincent, 2005; Grothmann & Patt, 2005).

Key to a discussion of scale, is understanding the nested nature of scale and linkages across scales (Adger et al., 2005; Adger & Vincent, 2005; Vincent, 2007). For example, individuals are embedded within a local scale, which is in turn nested with regional, national and international scales. As such, influences at one scale can have cascading effects upwards or downwards. Decisions made at the national level can have cascading effects regionally, locally and on individuals/households that can serve to constrain or facilitate adaptation (Adger et al., 2005). Winners and losers can be created at a variety of scales, given the cascading effects of decision-making in nested systems (Adger & Vincent, 2005).

At a local level, emphasis has been on communities or households (often used synonymously with ‘individual’; see for example Vincent, 2007). Recently, however, scholars have begun to advocate for increasing attention on the ‘cognitive’ level of adaptation and

adaptive capacity, meaning a focus on how individuals perceive risk and change, perceive their own ability to adapt to change and the mental strategies they employ in decision-making around adaptation (Grothmann & Patt, 2005; Kuruppu and Liverman, 2011). These cognitive processes are filtered through social and cultural experiences, and like other dimensions of adaptation and adaptive capacity, are embedded within institutional structures at multiple-scales.

Given the nested nature of adaptation and adaptive capacity, consideration of the relationship between these concepts and place identity will likewise need to consider scalar dimensions. Place identity is inherently a local phenomenon, but one that is also nested within broader social and cultural contexts. Furthermore, as noted earlier in the Chapter, place identity can also exist at a collective or community level.

#### 2.3.2.1 The Multi-Dimensionality of Adaptation and Adaptive Capacity

As first noted in Chapter One, adaptive capacity is multi-dimensional (Adger & Vincent, 2005; Vincent, 2007); this is a commonality across disciplinary perspectives. Within the climate change literature, the majority of research to date has emphasised the objective dimensions of capacity (e.g., political support, financial capital, human resources and technical skills) (Yohe & Tol, 2002; Grothmann & Patt, 2005). Objective capacity highlights what, if the necessary resources are accessible, a system or individual could do in response to climactic stimuli (Grothmann & Patt, 2005). Objective dimensions are exterior to an individual, and tend to reflect behaviours and properties or characteristics of systems (O'Brien & Hochachka, 2010; Aakvaag, 2013). Additional work has sought to address the forces that shape access and entitlements to these dimensions of objective adaptive capacity (e.g., Watts & Bohle, 1996; Adger & Kelly, 1999; Adger et al., 2005; Armitage, 2005).

Subjective dimensions of adaptive capacity also play a role in how individuals and communities experience and adapt to climate change (Lorenzoni et al., 2000; Grothmann & Patt, 2005; O'Brien & Wolf, 2010). At present, there has been limited systematic definition of subjective capacity, as comparable to an understanding of objective capacity. As identified in Chapter One, subjective dimensions of adaptation and adaptive capacity are more abstract, difficult to quantify, non-material and often relate to human characteristics such as attitudes, beliefs, values and motivations. They are interior, and are typically examined at the individual level, though they do also have collective dimensions (e.g., culture) (O'Brien & Hochachka, 2010; Aakvaag, 2013). Research on subjective capacity (within the climate change literature) has focused largely on perceptions of risk and impacts related to climate change and capacity to adapt (Lorenzoni et al., 2000; Wester-Herber, 2004; Grothmann & Patt, 2005; Kuruppu, 2009). A 'values-based approach' to vulnerability and adaptation research "makes explicit that there are subjective, qualitative dimensions to climate change that are of importance to individuals and cultures" (O'Brien & Wolf, 2010, p. 235). However, despite this identified importance, the subjective dimensions of climate change are largely missing from adaptation assessments such as the Intergovernmental Panel on Climate Change (IPCC) (O'Brien & Wolf, 2010). Therefore, there is a need to integrate subjective dimensions into climate change research, and the addition of new literatures for framing and conceptualizing subjective capacity can be useful in this regard (O'Brien & Wolf, 2010).

Understanding what facilitates or constrains adaptation and adaptive capacity can help in reducing vulnerability to environmental change (IPCC, 2007). Dimensions may be general in nature, or specific to a context or problem (IPCC, 2007). Some dimensions are more objective in nature, while some are more subjective. Some dimensions can have both subjective and objective

elements. Adaptive capacity is dependent upon the interaction of these dimensions, which function together to shape capacity of the system (Smit & Wandel, 2006). Adaptive capacity is shaped by both subjective and objective dimensions, and the intersection of these dimensions. As such, it is imperative to consider how both objective and subjective dimensions shape adaptation and adaptive capacity, and the relationships between them (O'Brien & Hochachka, 2010). Table 2 presents a list of dimensions of adaptation and adaptive capacity that can potentially shape how people adapt to climate change and other exposures. Given that the multi-dimensional nature of adaptation and adaptive capacity is recognized across interdisciplinary perspectives, these generic dimensions are therefore gleaned from across the differing environment and resource studies perspectives (see Plummer & Armitage, 2010). Much like the sub-constructs of place identity, the presence of influence of these dimensions is context-specific.

**Table 2: Selected Dimensions of Adaptive Capacity from Across Disciplinary Perspectives<sup>3</sup>**

Dimensions	Operational Definition/Description	Selected References
Information and Skills	According to Fankhauser and Tol (1997, p. 398), for adaptation to be successful, “[i]t requires first of all a recognition of the necessity to adapt, and, following this recognition, knowledge about available options, the capacity to assess them and the ability to implement the most suitable ones.” Information is necessary to understand the problem at hand, identification of how and why to adapt and of the necessary tools or strategies available for this. Better access to information can precipitate adaptation actions that are more appropriate and timely. Skills address the specific attributes of individuals and collectives to effectively engage in specific adaptation options, and allow for adaptation to occur through their efforts.	Swanson et al., 2007; Smit et al, 2001; Fankhauser & Tol, 1997
Economic resources	Resources include financial capital and other available monetary assets (e.g., insurance, lenders, micro-loans, etc.) for adaptation and often required to implement adaptation actions. Lack of access to economic resources often increases vulnerability (though is not the only predictor), with access being shaped by other determinants such as equity and other social factors such as poverty, gender, class and marginalization.	IPCC, 2007; Smit et al., 2001; Swanson et al., 2007; Burton et al., 1978; Dow, 1992
Capability	Capability is largely used to refer to building sustainable livelihoods. Capability is used generally to “refer to being able to perform certain basic functionings, to what a person is capable of doing or being” (Chambers & Conway, 1992). Part of this ability, in the perspective of Sen (1984) is being able to deal with risks and stressors and taking advantage of available opportunities, both proactively and reactively. As such, capability can also refer to the determination “of what goods can do to and for people” (Dow, Kasperson & Bohn, 2006; p. 82), through the ability to use and mobilize assets and entitlements in adaptation. Capabilities are the result of interplay between endowments and entitlements.	Armitage, 2007; Dow, Kasperson & Bohn, 2006; Leach et al., 1999; Chambers & Conway, 1992; Sen, 1984

<sup>3</sup> This is an extensive, though selective, list of adaptive capacity dimensions. In each of the disciplines additional dimensions have been identified. This list is not intended to be exhaustive.

Dimensions	Operational Definition/Description	Selected References
Endowments	Endowments are “the rights and resources that social actors have” (Leach et al., 1999), or should in principle, possess. Endowments can be tangible (i.e., resources, labour, etc.), or intangible (rights and claims to resources, access, etc.). Endowments can be transferred/transformed into entitlements.	Armitage, 2007; Sen, 1984; Leach, Mearns & Scoones, 1999; Adger et al., 2004; Chambers & Conway, 1992
Entitlements	Entitlements are “the set of alternative commodity bundles that a person can command in a society using the totality of rights and opportunities that he or she faces” (Sen, 1984, p. 497). Entitlements represent the rights and resources that an individual or group can actually gain access to or use or legitimately and “effectively command” (Leach et al., 1996, p. 233). They are influenced by complex socio-institutional relationships.	Armitage, 2006; Adger et al., 2004; Sen, 1984; Leach, Mearns & Scoones, 1996; Chambers & Conway, 1992
Access	Access deals with the right and ability (whether formal or informal) for people to make claims, acquire and utilize money, information, programs and services etc. It can also include competitions for resources. Access is shaped by power, inequality and other social variables, such as gender, class, poverty etc., and is intimately linked with equity, endowments and entitlements.	Chambers & Conway, 1992; IPCC, 2007; Adger, Paavola & Huq, 2006; Swanson et al., 2007; Smit & Pilosofova, 2001
Equity	Equity refers to fairness in access (and not just availability) and distribution of the necessary assets for adaptation, the manner in which winners and losers are created in adaptation and capacity-building and the nature of how people are included or excluded from places, in decision-making or in access to necessary adaptation assets. Equitable access and distribution of assets is linked to increased adaptive capacity and ability to cope with or address risk as a result of environmental change. Differentiation in equity can be shaped by class, gender, ethnicity, age, level of education, and in certain contexts, by health. Such vulnerable groups are often not given a choice in how or when to adapt, nor are they always fully included in development of policy decisions related to adaptations that affect them.	Adger; Paavola & Huq, 2006; Swanson et al., 2007; Smit et al., 2001; Chambers & Conway, 1992
Mobility/ migration	In some contexts, the ability to move around or to migrate to new places is essential for the ability to adapt and have resources available for adaptation. Migration itself often represents an adaptation; mobility, or the <i>ability</i> to move or migrate to a new place because of environmental change/risks, increased work and	McLeman & Smit, 2006; Adger et al., 2005; Wall & Marzall, 2006



Dimensions	Operational Definition/Description	Selected References
	economic resource opportunities or to improve access to resources can be a determinant of adaptive capacity (it can shape how adaptive people are). Conversely, a lack of adaptive capacity when dealing with environmental change may lead to displacements of marginalized or vulnerable populations. Mobility can also lessen social cohesion.	
Collective Action	The ability of actors (individuals, groups, societies etc.) to act collectively and work together to address environmental change and challenges, and to proceed towards adaptation, developing adaptation policy and building adaptive capacity. Collective action is linked with social capital, and the networks and trust that exist between actors: it arises and is strengthened or weakened by social capital. The ability or opportunities to engage in collective action solutions and being equipped with the necessary enabling conditions for cohesive collective action to take place can improve resilience and contribute to adaptive capacity.	Armitage, 2005; Tompkins & Adger, 2004; Adger, 2003
Willingness to adapt	At a cognitive level, a willingness to engage in adaptation behaviours and to select from a range of available options (irrespective of the higher levels shaping forces that contribute to adaptation) is important for individual level adaptation.	Wolf & Moser, 2011; Grothmann & Patt, 2005; Adger et al., 2004
Cognitive ordering/ structuring/ biases	Cognitive structures (mental models, schemas, perceptions; cultural and social framings) influence the manner in which people evaluate and structure the world around them. Cognitive biases, specifically, can influence an individual's perceived risk and adaptive capacity (often with negative consequences).	Kuruppu & Liverman, 2011; Adger et al., 2008; Grothmann and Patt, 2005
Risk/ adaptation awareness	Refers to the level of understanding and knowing associated with risks and the options available for adaptation and the assessment of these options and risk (i.e., are people aware of the level of risk or the likelihood of occurrence?). Also linked with risk attenuation or amplification, whereby risks and threats may be downplayed by the individual or overplayed depending on the context.	Kuruppu & Liverman, 2011; Wolf & Moser, 2011; Lorenzoni & Pidgeon, 2006; Grothmann & Patt, 2005
Perception of capacity	This is linked with cognitive structures, and risk/adaptation awareness. Refers to the manner in which individuals perceive their ability to deal with and address change, and to adapt accordingly. Levels of perception of individual capacity to adapt can influence the choices of adaptation behaviours and options.	Kuruppu & Liverman, 2011; Grothmann & Patt, 2005; Lorenzoni et al., 2000

Dimensions	Operational Definition/Description	Selected References
Social Status	An individual's or group's social status (whether related to caste, gender, income, ethnicity, etc.) can influence access to endowments and entitlements, and the ability to mobilize and utilize such things. It can also influence access to places/lands (inclusion/exclusion), and typically reflects manifestations of power.	Adger et al., 2006; Swanson et al., 2007; Smit et al., 2001; Chambers & Conway, 1992
Social Capital and Social Networks	Social capital focuses on the relationships that exist between actors in a society, what links those actors together and “provides an explanation for how individuals use their relationships to other actors in societies for their own and for the collective good” (Adger, 2003, p. 389). People working collectively require flows of information and linked networks of actors, which are formed based on feelings of mutuality, reciprocity and trust. Social capital is built via social interactions in-place, and can be fundamental to collaboration in resource management and adaptation. Networks between actors are a critical aspect of building and maintaining social capital. Social networks, and the flows of information and resources through them, can influence how people perceive and interact with climate change, and can be a defining factor in behavioural change. Networks can be measured by density, centrality, reachability and betweenness. Social capital includes both bridging capital and bonding capital. Bridging capital is comprised of the networks and relationships that exist over greater distances in the social landscape that often centre on modes of exchange; such relationships are typically ‘weaker’ than bonding capital. Bonding capital is made up of strong relationships or ties to close associates often with shared social identity (typically family, friends, colleagues, etc.). Linkages between and across bridged and bonded network boundaries can strengthen the overall social capital of an individual or group. Social capital can be influenced through a variety of means including development of and belonging to social groupings, scale and location, institutions, culture, shared language and shared values.	Plummer & Armitage, 2010; Plummer & FitzGibbon, 2007; Pelling & High, 2005; Bodin, Crona, Ernstson, 2006; Adger, 2003
Learning	Learning through change and uncertainty can be critical for building adaptive capacity. According to Plummer & Armitage (2010, p. 12), “learning involves the collaborative or mutual development and sharing of knowledge by multiple stakeholders, and feeds directly into the development of capacity for adaptation by individuals and social collectives”. Learning can transform the behavioural response	Plummer & Armitage, 2010; Diduck, 2010; Pelling et al., 2008; Armitage, Marschke

Dimensions		Operational Definition/Description	Selected References
		of an actor based on experiences of that individual (or potentially through vicarious experiences, as described by Bandura, 1982, though that discussion was not linked with concepts of adaptation). Systemic institutions (rules, norms and conventions of a particular system) that allow for and foster opportunities for transformative learning to take place, can lead to strengthened adaptive capacity. Learning can take place at an individual level, with an action group (collective learning), within an organization, via network processes or through societal learning. Learning is also linked at multiple levels, and can be shaped by socio-cognitive filters, organizational frames, deliberative or facilitated platforms and via social network flows of information. Learning has been typically described as having distinct types or what are termed as ‘loops’. Single-loop learning “typically involves the identification of alternative strategies and actions (e.g., harvesting techniques) to resolve specific problems and improve certain outcomes (e.g., improved incomes, higher yields)” (Armitage et al., 2008, p. 88). Double-loop learning involves challenging the assumptions upon which single-loop learning is based and focuses on conflicts related to values and norms that shape single-loop learning. It often leads to changes in behaviour. Triple-loop learning is a reflective process that designs new or revisits existing norms, worldviews and protocols that influence single- and double-loop learning in an effort to predicate larger-scale change within a system.	& Plummer, 2008; Folke et al., 2002
Multiple knowledge systems	Bridging and linking multiple knowledge systems	Bringing together multiple ways of knowing can be important for framing and developing adaptation options. Linking or drawing from multiple knowledge systems recognizes that there are a variety of groups with unique information that can contribute to understanding environmental change. The process by which multiple knowledge systems may be brought together is often linked with understandings of learning. The manner in which systems are brought together can be fraught with discursiveness and power. Recent efforts have focused on bridging local or Indigenous knowledges with Western scientific knowledge to create robust policies and understanding of ecological and social change that draw from a wide variety of ways of knowing the world.	Plummer & Armitage, 2010; Folke et al., 2005; Armitage, 2005; Olsson et al., 2004; Ludwig, Mangel & Haddad, 2001
	Traditional and local knowledge	Environments are naturally dynamic, and Indigenous peoples have been adapting to such changes since time immemorial. As stated by Huntington and Fox (2005, p.90), “[t]he peoples of the Arctic are familiar with these characteristics of their homeland,	IPCC, 2007; Berkes, 2008; Furgal & Seguin, 2006;

Dimensions	Operational Definition/Description	Selected References
	<p>and recognize that surprises are inherent in their ecosystems and ways of life. That is why indigenous peoples tend to be flexible in their ways and to have cultural adaptations, such as mobile hunting groups and strong sharing ethics that help deal with environmental variability and uncertainty”. These adaptations are encapsulated in Traditional knowledge that has been passed down from generation to generation. Traditional knowledge, including values systems and oral traditions, can provide a repository for past adaptive strategies of Indigenous communities.</p> <p>Furthermore, connection to tradition and heritage can strengthen identity and in turn, social cohesion, which is important for adaptation to environmental change and building social capital.</p>	<p>Huntington &amp; Fox, 2005; Berkes &amp; Jolly, 2001</p>
Memory	<p>Memory addresses the rules, values, norms and mores that become part of a system and are continually renewed and passed on. Memory can refer to cultural memory, institutional memory, corporate memory, social memory or ecological memory, and so forth. For example, Bodin et al. (2006) identify social memory as “collective memory/experiences to be used in times of change and uncertainty”. Ecological memory is the “composition and distribution of organisms and their interactions in space and time, and includes the life-history experience with environmental fluctuations” (Folke et al., 2003, p. 363). Memory in a system (regardless of type) is built over time. While diversity is important for renewal and reorganization, memory acts like a form of ‘insurance’ against complete upheaval during regime shifts. When memory is lost, it can threaten adaptive capacity, as ways of doing things (i.e., adapting to changes, understanding changes, reading landscapes, risk-spreading mechanisms, etc.) may be lost.</p>	<p>Bodin et al., 2006; Folke, Colding &amp; Berkes, 2002; Chambers &amp; Conway, 1992</p>
Institutions and institution building	<p>Institutions are “the conventions, norms and formally sanctioned rules of a society. They provide expectations, stability and meaning essential to human existence and coordination. Institutions regularize life, support values and produce and protect interest” (Vatn, 2005, p. 60). As choice is a fundamental aspect of adaptation, the institutions that shape that choice are an important enabling factor. According to O’Riordan and Jordan (1999, p. 81), institutions act “as a means for holding society together, giving it sense and purpose and enabling it to adapt.” Systems (and this is often addressed at the national level) that have more effective and developed institutions (particularly with reference to social institutions) are often in a better</p>	<p>Plummer &amp; Armitage, 2010; Vatn, 2005; Smit et al., 2001; Adger &amp; Kelly, 1999; O’Riordan &amp; Jordan, 1999</p>

Dimensions	Operational Definition/Description	Selected References
	position to address adaptation to environmental change, and typically have greater adaptive capacity. Well-functioning institutions can improve capacity for dealing with future risks and stressors. Institutional constraints can negatively impact access to resources and entitlements and can shape equity (both implicitly and explicitly).	
Valuing future livelihoods	According to Chambers & Conway (1992, p. 12), valuing and “[p]lanning for future livelihoods implies a placing of value on the future”. Placing a value on the future means wanting to protect certain facets of the environment and ways of life so that subsequent generations may continue to reap the benefits. Though it is important, future livelihoods and future generations are often undervalued in the planning and decision-making processes.	Chambers & Conway, 1992
Values	While much of the discussion about the relationship between values and climate change has centred on how things of value may be impacted by change, values are gaining increasing recognition as a key determinant of how people choose to adapt to environmental change. For example, how people judge and respond to climate change and related impacts are inherently tied up in value judgements. Values influence how rules and institutions are developed for addressing risk, change and allocation. As O’Brien and Wolf (2011, p. 233) note, “what is considered legitimate and successful adaptation depends on what people perceive to be worth preserving and achieving, including their culture and identity”. Understanding individual and collective values can help to determine social limits to adaptation, by understanding how values may shape the choices that people make. Additionally, accounting for values and taking a “values-based approach can potentially foster an inclusive process in local adaptation practice that openly reflects the diverse values represented in communities, building common ground for adjusting to change”. Values are linked strongly with many of the other determinants in this list, including Traditional knowledge, perception of capacity to adapt, risk awareness, cognitive structuring and valuing future livelihoods.	Fresque-Baxter & Armitage, 2012; O’Brien & Wolf, 2010; Adger et al., 2009

A critical question, which will be explored further below, is how components of place identity influence or interact with the dimensions of adaptation and adaptive capacity – both objective and subjective – to shape current and future adaptations. First, I discuss two frameworks that can be used as the basis to explore the place identity-adaptive capacity nexus.

### 2.3.2.2 Frameworks and Approaches for Unpacking and Investigating Adaptation and Adaptive Capacity

To unpack the place identity-adaptive capacity nexus and explore the subjective dimensions of adaptation and adaptive capacity, I draw on one established framework and one emerging approach, and intersect them. I start first with a values-based approach (*sensu* O'Brien & Wolf, 2010) which positions subjective dimensions of climate change, adaptation and adaptive capacity – with particular emphasis on types of values – as its starting point of reference. The values-based approach provides a broad lens – and rationale – from which to examine and unpack the nature of relationships between place identity and adaptation and adaptive capacity.

Values-based approaches are positioned as building on and providing alternatives to outcome-based and contextual approaches. O'Brien and Wolf (2010) build an argument for a values-based approach to adaptation assessment given that “what is considered to be legitimate and successful adaptation depends on what people perceive to be worth preserving and achieving, including their culture and identity” (p. 233). Berger and Liverman (2008, p. 13), with particular reference to the Northern world, identify a need to make sure that “a more complete understanding is developed of the ways in which peoples’ beliefs and values reflect their experience with landscape and climate change” is emphasised in environmental research.

Core aspects of a values-based approach are an examination of what matters to people; how people perceive and experience climate change in relation to the things they care about

(subjective perception of risk); an analysis of the values (including impacts to values) that emerge out of understanding how people perceive and experience change; and, how what people value or care about influences how people cope with and adapt to real or perceived change (including views on appropriate adaptations) (O'Brien & Wolf, 2010; Wolf et al., 2013).

The consideration of values as a starting point for understanding adaptation and adaptive capacity is consistent with calls for increased emphasis on subjective dimensions of adaptation and adaptive capacity, including the cognitive, individual dimensions (which include values and value judgements) of how people adapt (see for example, Lorenzoni et al., 2000; Grothmann & Patt, 2005; Kuruppu, 2009; Kuruppu and Liverman, 2001). As such, adaptation and values are directly linked (O'Brien & Wolf, 2010). O'Brien and Wolf (2010) further suggest that research on the subjective dimensions of climate change remains a gap both in theory and practice, requiring the addition of new literatures to fully explore such subjective dimensions. Through an examination of the links between place identity, change and adaptive capacity, I aim to address this gap and contribute to the empirical and theoretical work on subjective dimensions of adaptive capacity. I posit that place identity may be a possible subjective dimension of adaptive capacity, through potential influence on how people perceive and experience community-identified change, and on how people make adaptation choices. If place identity shapes these things, then understanding place identity in relation to adaptation – and the other objective and subjective dimensions that shape it – may help identify opportunities for maintaining and/or fostering adaptive capacity that reflects individual and collective values associated with identification with place(s). It is important to note that though the values-based approach often focuses on specific types of values (e.g., basic and universal; intrinsic and extrinsic), it is being adopted in this research for its broad approach to the subjective dimensions of adaptive capacity.

Building on and adapting the values-based approach with place identity as a starting place, I now turn to a community-based vulnerability assessment framework, as a way of operationalizing understanding of local adaptation and adaptive capacity (Ford & Smit, 2004; Prno et al., 2011). There have been many complementary iterations of community-based vulnerability assessments, all of which emphasize common elements, and here I focus specifically on the ‘Community Adaptation and Vulnerability in Arctic Regions’ (CAVIAR) framework, which was developed, refined and operationalized for use in Northern contexts (Smit et al., 2010)

The CAVIAR framework, which is a ‘contextual’, second-generation approach to vulnerability and adaptation assessment can be used to unpack how place identity may shape experiences and perceptions of water change (exposure-sensitivities), choice of adaptation strategies, how place identity may influence those choices at both individual and collective levels, and how place identity may shape potential adaptive capacity in the community of Fort Resolution. The CAVIAR framework offers a simple, tractable, well-defined organizing framework to unpack core concepts related to adaptation and adaptive capacity. This framework was selected primarily because of its emphasis on a participatory, bottom-up approach that identifies exposure-sensitivities, adaptations and dimensions of adaptive capacity based on experiences, knowledge and insights of community participants (Smit, Hovelsrud & Wandel, 2008; Smit et al., 2010; Berkes & Armitage 2010). Research employing this framework – or adaptations of it – are collaborative endeavours between the community and researcher(s), “given the methodological assumption that vulnerability must be understood and documented by asking community members to identify relevant information on exposure-sensitivities and adaptive capacity” (Berkes & Armitage, 2010, p. 112). As Hinkel (2011) notes, it is imperative



that definitions and understandings of concepts like ‘harm’ and ‘vulnerability’ (among others), be guided by the case in question, given the plethora of differentially defined terms and the conceptual and methodological ambiguity present with the current environmental change discourse. So though terms like adaptation, adaptive capacity, exposure-sensitivities and vulnerability are defined and widely-used in the climate change literature, operationalizing such terms requires case-specific evaluation and co-defining of terms with those dealing with change.

It is important to note however, that though this particular approach typically takes vulnerability at its starting point, in this research use of the framework is intended to unpack how place identity influences perceptions of exposure-sensitivities and choice of adaptations, towards the end goal of examining the link between place identity and adaptive capacity. Thus, while the relationships of these elements to vulnerability is acknowledged, vulnerability is not the focal point of this research.

Within the CAVIAR framework, the starting point for analysis is current exposure-sensitivities. Identifying exposure-sensitivities “requires the identification of forces, stresses or processes which affect livelihoods or well-being of people in the community” (Smit et al., 2010, p. 8). This is done collaboratively with local community members, reflecting an inductive process that identifies issues and changes that are relevant to the community in question. Given the inductive nature of this analysis, the exposure-sensitivities identified result from experiences and perceptions of change in places that are important for livelihood and well-being (i.e., valued and meaningful places) (Smit et al., 2010). As these exposure-sensitivities are not identified *a priori*, identifying them through the lens of community relevance accommodates non-climatic factors as well. This is of particular importance as determining the level of influence of climate change versus non-climatic drivers in change scenarios can be a challenging task (IPCC, 2007).

Secondly, current adaptive strategies employed by community actors to deal with community-identified exposure-sensitivities are documented (Smit et al., 2010). These can include short-term coping responses and longer-term adaptive strategies. Taken together, current exposure-sensitivities and current adaptive strategies constitute current vulnerability of the community and actors within it. Secondary sources of information and instrumental records can also provide insights into current vulnerability (Smit et al., 2010).

Future vulnerability, based on understanding of current experiences and action, is then assessed. First, potential future exposure-sensitivities are identified through examination of potential trends in current exposure-sensitivities, participants' assessment of possible future conditions or through analysis of climate scenarios (Smit et al., 2010). Often scientific knowledge is used in framing this component of the analysis. Then future adaptive capacity is assessed. This can draw on information gleaned from understanding current adaptive strategies, discussing future exposure-sensitivities and potential responses with community participants, and from information from social sciences on adaptive capacity (i.e., insights from the literature and other cases) (Smit et al., 2010). Thus, understanding the differing dimensions of adaptive capacity (see section 2.3.2.1 above) can provide a useful organizing framework or set of sensitizing concepts from which to unpack experiences.

With all aspects of the framework's analysis taken together, it becomes possible to identify needs and options for improving ability to cope with climate change and other exposures, and make recommendations for policy and practice (Smit et al., 2010). This framework (or iterations of it) has been widely used in the circumpolar region, including Northern Canada, and other pan-arctic countries (see for example, Laidler et al., 2009; Berkes & Armitage, 2010; Hovelsrud, Dannevig, West & Amundsen, 2010; Andrachuk & Pearce, 2010;

Prno et al., 2011). As such, it is well-tested, adaptable to unique community conditions, and provides potential future opportunities for comparative analysis. Recently, however climate change research on adaptation and adaptive capacity (including research framed using the approach described above) has been criticized for neglecting or de-emphasising the subjective dimensions of climate change impacts and adaptive capacity (Grothmann & Patt, 2005; Kuruppu & Liverman, 2009; O'Brien & Wolf, 2010; Wolf & Moser, 2011; Adger, 2011; Wolf et al., 2013). Though research that has employed the CAVIAR model and other approaches to understanding climate change vulnerability and adaptation have touched upon values and subjective dimensions, such considerations are often not fully conceptualized and/or treated as an afterthought (Wolf et al., 2013). Additionally, values are often a passing mention or discussed broadly in relation to cultural identity and traditional lifestyles (Wolf et al., 2013). Identity, when considered, is thus framed more strongly from a broader cultural perspective. This broad framing, though important, may not capture the full range of sub-identities within an individual's overall identity (see section 2.2 above), including the person-place bonds that contribute to aspects of identity ('place identity'). Recent calls have been made for research on subjective dimensions of adaptation and adaptive capacity that explicitly consider place identity in relation to experiences of change (e.g., Adger et al., 2011; Fresque-Baxter & Armitage, 2012; Wolf et al., 2013).

Thus, there is rationale for adapting and intersecting these two frameworks or approaches. The CAVIAR framework provides the organizing structure to unpack key concepts of adaptation and adaptive capacity (including vulnerability, scale, exposure-sensitivities, responses and dimensions of adaptive capacity) to fully understand how change is experienced in and by communities, and how communities make choices about adaptation and multiple scales.

The use and adaptation of the values-based approach allows for the positioning of subjective dimensions of adaptive capacity as the starting point of the analysis, in order to examine how such subjective dimensions – namely, place identity for the purposes of this research – influence *experiences* and *perceptions* of exposure-sensitivities, choice of adaptation responses and potential adaptive capacity. Given the participatory, bottom up nature of the CAVIAR model, it is well-positioned for integrating subjective understandings of change, through the values-based approach. Using these two approaches in conjunction provides a rich, robust analysis of how communities experience and deal with change, and how place identity both shapes and is shaped by such changes and responses.

#### 2.3.2.3. Adaptation to What?

Core to understanding adaptation and adaptive capacity is the question ‘adaptation to what?’ Northern communities in NWT, including Fort Resolution, have been, and are currently, subject to changes and impacts associated with climate change and variability, including impacts to water quality, quantity, and flooding (Furgal & Prowse, 2008; GNWT, 2008; Wesche, 2009). However, it is imperative to recognize that water conditions will not be solely influenced by climate change alone, nor is climate change the only factor to which Northern communities will have to adapt (Heyd, 2008). Indeed, many authors suggest that climate change cannot be considered in isolation from other drivers of change (whether environmental, political, social or economic), but rather it is critical to consider how multiple drivers at multiple scales intersect in creating vulnerability and shaping adaptation (Scheraga, Ebi, Furlow & Moreno, 2003). Much work has addressed the intersection of climate change and globalization, given that processes and institutions of globalization can facilitate or constrain adaptation to climate change (O’Brien &

Leichenko, 2000; O'Brien et al., 2004; Keskitalo, 2008). Both globalization and climate change create 'winners' and 'losers', and in some cases, systems may be exposed to both, creating 'double-exposures' and double wins and losses, exacerbating vulnerability and the ability to adapt (O'Brien & Leichenko, 2000; O'Brien et al. 2004; Keskitalo; 2008).

Non-climatic factors can shape the sensitivity and exposure of a system to climate stimuli (Fussler, 2007). Scheraga and Grambsch (1998) suggest that in order to develop appropriate adaptation solutions, it is necessary to understand climate stresses in the context of multiple stressors, and to determine the extent to which these may have exacerbating or ameliorating effects on climate change impacts. Additional non-climatic stressors (e.g., poverty, food insecurity, health concerns) will likely be exacerbated by effects of climate and industrial development on water resources (Furgal & Prowse, 2008; Wesche, 2009). Therefore, while this research begins with and is rooted broadly in climate change and its impact on water, other major drivers of change are also a part of the overall story of how the community experiences and perceives changing water conditions. Given the participatory, bottom-up nature of the CAVIAR framework, additional stressors – or 'multiple-exposures' – can be accommodated in this approach.

#### ***2.4 Framing the Relationships between Place Identity and Adaptation and Adaptive Capacity***

This section explores the proposed theoretical relationship between place identity and adaptive capacity. As previously discussed, the importance of 'place' and related constructs for adaptation and adaptive capacity has been noted (Beckley et al., 2002; Parkins et al., 2004; Fabricius et al., 2007; Hunter, 2008; Kofinas & Chapin, 2009; Marshall et al., 2009). For example, Adger and colleagues (2013) recognize the intimate linkages between culture and

‘place’ and the influence of these linkages, as well as attachment to places, on adaptation. Kofinas & Chapin (2009) state that fostering self-esteem and self-actualization by building upon sense of place can create opportunities for ecosystem stewardship. They add that “people’s appreciation for their relationship to nature....is often a strong motivation for ecosystem stewardship and sustainability and can be a powerful stabilizing feedback for managing rates of change” (Kofinas & Chapin, 2009, p. 62). Beckley et al. (2002) consider sense of place and attachment an indicator for community sustainability in the context of forest change. However, as noted, a gap remains in systematically examining how people-place relationships shape individual and collective adaptive capacity, particularly given the limited emphasis on subjective dimensions.

More research is needed to address personal experiences with changing resources and the impacts these experiences have on vulnerability and adaptation (Grothmann & Patt, 2005; Klein et al., 2007; Berger & Liverman, 2008; Relph, 2008). In this dissertation, place identity is thus posited as a potential subjective dimension of adaptive capacity, in that meanings and values assigned to places that people identify will inform how people understand, care for and behave in a place. As identified above, adaptive capacity is dependent upon the interaction of dimensions, which function together to shape capacity of the system (Adger et al., 2005; Smit & Wandel, 2006; Vincent, 2007). This section draws on diverse literatures to explore how key constructs of place identity (Table 1) may be potentially related to objective and subjective dimensions of adaptive capacity, and their requisite dimensions (Table 2). Building on the two frameworks identified in Section 2.3.2.2, we can explore possible linkages through the influence of place identity on: 1) perception and experience of exposure-sensitivities (including perceived impacts to place identity from such perceptions and experiences); and, 2) on adaptation choices and

adaptive capacity. Note that while presented here as discrete sections, in practice they are likely to overlap substantially as experience and perception are anticipated to shape action.

#### ***2.4.1 Experience and Perception of Exposure-Sensitivities***

Understanding how people identify and experience exposure-sensitivities is a critical aspect of the CAVIAR framework. As noted by O'Brien and Wolf (2010) and Wolf et al. (2013), it is expected that values and other subjective dimensions of adaptive capacity can shape how people perceive and experience impacts related to climate change, and other drivers. Thus, if we take place identity as a starting point in an intersected values-based-CAVIAR approach, we can examine possible theoretical linkages that are based on people's understanding of exposure-sensitivities in relation to places they deeply identify with. Understanding the potential connection between place identity and adaptive capacity begins with "the premise that people's valuations of and behaviour in place are primarily driven by how the human mind processes information about a geographic setting" (Cheng, Kruger & Daniels, 2003, p. 92).

Grothmann and Patt (2005) developed the Model of Private Proactive Adaptation to Climate Change (MPPACC), drawing on Protection Motivation Theory, to empirically assess why some individuals display adaptive behaviour in the face of climate change and why others may not. In the MPPACC model, two key cognitive perceptual processes related to how exposure-sensitivities are understood: risk appraisal and capacity appraisal. Outcomes of these two key processes mediate individual responses. Risk appraisal centres on cognitive understandings of the risks associated with climate change impacts, through individual assessment of perceived probability (likelihood that the individual will be exposed to a particular risk) and perceived severity (how harmful the risk will be if it occurs) (Grothmann & Patt, 2005).

A process of adaptation appraisals follows appraisal of risk and development of risk perceptions, and will be discussed further in the section on adaptation choices.

The relationship an individual has to a particular place influences how they understand and navigate it, and as such this relationship will characterize their response to a place, which influences actions and emotions (Steele, 1981; DeMiglio & Williams, 2008). Specific values and relationships to place, many of which have an affective dimension, whether shaped by personal interest or filtered through social-cultural structures, may to a certain degree influence how people perceive and understand the severity and probability of risks associated with climate change impacts (Wester-Herber, 2004; Grothmann & Patt, 2005). More specifically, place identity values may influence what types of impacts to place are observed or not observed and how threats to place are perceived (Proshansky et al., 1983). Place-identity is based on intimate experience with a particular place and the feelings and attachment that stem from that relationship. Because of extensive experience, environmental mastery and attachment to place, impacts could be detected more readily (Kaltenborn, 1998) and as such more strongly influence the adaptation process towards place-protective behaviours.

According to the APA (2010) “it is hypothesized that certain strong emotional responses, such as fear, despair, or a sense of being overwhelmed or powerless, can inhibit thought and action” (p. 43). Grief, anxiety and feelings of loss can result from a loss of place-based connections, particularly for individuals who have a strong place identity (APA, 2010). How and what changes are detected reflects values of individuals and communities. What exactly is being threatened by changes and how these influence place-identity (i.e., particular land features, well-being, quality of life, etc.) must be accounted for in risk appraisal (O’Brien et al., 2004), as this will likely to influence how change is perceived and understood by individuals.



Relationships to place are based on continuity and distinctiveness and inform values, needs, preference and behaviours associated with use/experience of a particular place (Twigger-Ross & Uzzell, 1996). When place changes are observed by an individual as threatening, an appraisal of place occurs. In the face of change that may be incongruous to self-reference, processes of denial or downplay of the threat can also occur (Twigger-Ross et al., 2003), which is related to the assessment of probability and severity (Grothmann & Patt, 2005). Changes and experiences must be accommodated by the individual into existing understandings of place (Inhalan & Finch, 2004). This may involve actions such as those described above, or it may be possible for people (consciously or unconsciously) to not detect changes in order to maintain place-identity congruence. In this case, place identity may actually manifest as limiting factors in the cognitive adaptation process. In many cases, denial of change can be a coping mechanism to protect place-identity and psychological well-being (Twigger-Ross et al., 2003; Grothmann & Patt, 2005). If risks are imminent, yet not appraised due to cognitive dissonance leading to maladaptation, vulnerability may be increased.

When places no longer meet the needs or values assigned by the people who have used them, place identity can become threatened. These changes feed back into appraisals of capacity to adapt and risk perception (Wester-Herber, 2004). Such impacts to place may also influence choice of adaptive strategies, whether place-protective behaviours or maladaptive behaviours, as will be discussed in the next section.

#### ***2.4.2 Adaptation Choices and Adaptive Capacity***

Identity is an important aspect of well-being and resilience (Turner et al., 2008). A perceived change in the physical environment, especially when particularly salient for

individuals, “can touch the core of how individuals define themselves and their interactions with the world around them” (Adger et al., 2009, p. 349). A loss of self-identity, in conjunction with other stressors associated with climate change, can lower individual and community abilities to withstand and cope with change (Turner et al., 2008). There are potential connections that can be drawn around understandings of individual agency to adapt (particularly with reference to self-esteem and self-efficacy, critical to both place identity and adaptive capacity theory), and engagement in collective action processes. Unpacking these areas, in relation to place identity and adaptation and adaptive capacity, can allow us the opportunity to draw connections between the concepts.

When relationships with place are strong and maintained by individuals there is a sense of mental well-being associated with being in that place or belonging to that place (Steele, 1981; DeMiglio & Williams, 2008). Attachment to place can contribute to the development of sense of belonging and a feeling that one’s life has purpose, which influences overall health and well-being (Davenport & Anderson, 2005; Proshansky et al., 1983) and can contribute to self-esteem and self-efficacy. When places change, or experiences result in negative senses of place, mental well-being may be impacted, resulting in feelings of displacement, alienation and grief (Fried, 1963; Brown & Perkins, 1992; Stedman, 2002; Inhalan & Finch, 2004; DeMiglio & Williams, 2008). Changes may be overwhelming and lead to negative impacts on self-concept and well-being (Fried, 1963; Twigger-Ross & Uzzell, 1996; DeMiglio & Williams, 2008), thereby increasing vulnerability. Physical environmental changes can alter the manner in which people interact with their environment, and alter constructions of reality (Adger et al., 2009). Experiences/perceptions of exposure-sensitivities in places that people identify strongly with can lead to the need to make decisions about how to deal with those changes.

Personal agency is an important part of individual decision-making. As the foundation of agency, “self-efficacy beliefs are an individual’s belief in their own capacity to exercise some control over their actions and external events and produce desired results” (Fresque-Baxter & Armitage, 2012, p. 256; Bandura, 2001). Individuals would have limited incentive to engage in action if they did not hold such beliefs about their capability (Bandura, 2001). Individuals choose actions based to a certain extent on their own perceived self-efficacy and capability of addressing particular types of situations. It is also possible that individuals may over- or under- estimate their ability to address a given situation, and their thought patterns may bolster or hinder their perceived self-efficacy (Bandura, 1986). As identified by Grothmann & Patt (2005) in their cognitive model, following appraisals of risk and severity, people engage in appraisals of perceived adaptation efficacy (belief in the effectiveness of adaptation actions in protecting the self and others), perceived self-efficacy (individual belief that one can carry specific adaptation actions) and perceived costs of adaptation (what it will cost to engage in specific actions) (Grothmann & Patt, 2005). These three sub-components contribute to an overall perceived adaptive capacity. Additional studies have sought to utilize and expand understandings of perception of adaptation efficacy (e.g., Kuruppu & Liverman, 2011). Kuruppu & Liverman (2011) suggest that although affective heuristics are missing from the MPPACC model, they are an important aspect in understanding how risk and capacity assessments are shaped.

Self-efficacy is also an important concept within place identity theory. Self-efficacy focuses on people’s perceptions of their ability to function and carry out activities within a manageable environment (Twigger-Ross & Uzell, 1996). When a place changes, it may no longer be manageable and as such threatens feelings of self-efficacy as related to that environment (Twigger-Ross & Uzzell, 1996). These changes may also impact perceptions of

environmental controllability. All of this contributes to threatened place identity, as a result of environmental changes. Emotional and mental states can be negatively affected by changes to place that are incongruent with existing place identity schemas, leading to experiences of grief, loss and alienation (Fried, 1963; Brown & Perkins, 1992; DeMiglio & Williams, 2008). Negative experiences related to change may also lead to a decrease in an individual's overall sense of belonging and well-being, as mediated through changes to self-esteem and self-efficacy (Twigger-Ross & Uzzell, 1996). This may influence an individual's perception of their ability to adapt and deal with change, creating a potentially vicious cycle.

The above-identified appraisal processes may influence the adaptation intentions (Grothmann & Patt, 2005), namely what an individual intends to do to address identified exposure-sensitivities. This adaptation intention subsequently informs actual adaptation actions (Grothmann & Patt, 2005). Several possible adaptation actions are possible, which may be informed in part by place-identity and its influence on the appraisal process. For example, according to Manzo & Perkins (2006), in a discussion about neighbourhoods, strongly place attached individuals are more likely to watch over their neighbourhood and to engage in collective neighbourly interactions. Similarly, Stedman (2002) notes that the more central a place is to identity, the more "we are willing to fight" for it when we feel that conditions are unsatisfactory (p. 577). Additionally, in a study of residents of Svalbard, Norway, Kaltenborn (1998) found that individuals with a more strongly measured sense of place were more likely to express a willingness to collectively engage in solving environmental issues. Strongly attached individuals could act as an impetus or nexus for beginning to bring people together in collective action initiatives. However, it is important to note that strength of attachment alone is not a predictor of behaviour, and attachment must be considered in concert with the place meanings

that define that attachment (Stedman, 2002; Davenport & Anderson, 2005). Conversely, if an individual's self-esteem has been negatively impacted and their perception of adaptive capacity is low, then it is possible limited actions will be taken to deal with a particular threat, thereby potentially increasing vulnerability.

Places are also the settings in which social connections and activities take place. Strong attachment to, or sense of a place, can also foster a sense of community (Horwitz et al., 2001; Relph, 2008), which can contribute to decreased feelings of isolation and loneliness, and therefore, increased overall health and well-being of individuals (Horwitz et al., 2001). This can have implications for self-efficacy and perceptions of one's ability to deal with change. Place-making is an ongoing process of interacting with and transforming places, and this process can serve to strengthen both individual and community identity with places, resulting in common values, shared history and joint narratives (Horwitz et al., 2001).

Feeling connected to others, and having a sense of community can contribute to community organizing for climate change stewardship (Ebi & Semenza, 2008). According to Adger (2003, p. 387), "adaptation is a dynamic social process: the ability of societies to adapt is determined, in part, by the ability to act collectively". Shared values and identity can play an important role in creating and reinforcing space(s) in which people can collectively organize and engage in actions (Polletta & Jasper, 2001; Conway, 2004; Robbins, 2004; Bebbington et al., 2008). In discussing the role of place attachments and place meanings in relationship to community planning, Manzo & Perkins (2006) assert that "[o]ur thoughts, feelings, and beliefs about our local community places – what psychologists call "intra-psychic" phenomena – impact our behaviours towards places, thus influencing whether and how we might participate in local planning efforts" (p. 336).

Environmental degradation may change how people interact with their environments (Adger et al., 2009), including changing the nature of the activities people engage in (see for example, Turner et al., 2008). When activities are changed (whether from environmental or social change such as forced relocation) social ties of people to others in a place can be impacted, which may result in loss of mutual support networks (Horwitz et al., 2001; Relph, 2008), and/or ability to engage in activities which previously fostered social interaction. This results in a break in continuity, which is a critical place-based value important for place identity (Twigger-Ross & Uzzell, 1996; Horwitz et al., 2001). Loss of activity and severance of social ties can also lead to impacts on psychological health, including decreased self-esteem (Horwitz et al., 2001; Turner et al., 2008). Turner et al., (2008) highlight this using the example of traditional harvesting activities of Indigenous groups in Western Canada. When people are no longer able to engage in certain types of traditional activities (whether related to social, political or environmental change), they may feel an inability to provide for their families or fulfill cultural obligations, resulting in feelings of loss, alienation, shame, frustration and helplessness (Turner et al., 2008). This in turn impacts self-esteem and individual feelings of worth, and can result in intergenerational impacts on families and communities, including the ability to pass knowledge and cultural values to younger generations (Turner et al., 2008).

While impacts to place can disrupt the social ties enacted through place(s), they can also serve as a mechanism for linking people in place-protective behaviours and collective action. As the social movements literature suggests (as described in Robbins, 2004), environmental changes and subsequent threats to identity can create opportunities for linking people with shared identities and shared values of place in an on-going process to develop novel and innovative solutions for dealing with collective action problems. Social movements are predicated on

participants sharing an understanding of a collective identity and perceiving a threat to said identity (Polletta & Jasper, 2001; Conway, 2004; Bebbington et al., 2008). Members often share collective values and interests and aim to challenge mainstream views or processes which impact their self-conception. Groups maintain strength and cohesion through this act of creating and experiencing shared identity and values (Bebbington et al., 2008). Engagement in social movements, through sharing and creating identity and place based values can contribute to creating a 'space' or context for engaging in collective action.

Connections with others foster increased social capital and can aid in creating networks that people can rely on during times of need, stress or crisis (Adger, 2003; Relph, 2008). It is these social networks that can also be drawn upon for developing collective action solutions to the myriad environmental and social impacts that may result from climate change. Shared values can also contribute to the development of trust (Davenport et al., 2007). This serves to continually foster and strengthen social capital, thereby further increasing community level adaptive capacity. Brown, Perkins & Brown (2003) identify social cohesion as a part of collective efficacy, along with social control.

Adger (2003, p. 388) suggests that, "the effectiveness of strategies for adapting to climate change depends on the social acceptability of options for adaptation," and as such it is important to know what people value and why, what their preferences and concerns are and what they prioritize, prior to developing strategies for environmental management or climate change adaptation (O'Brien & Wolf, 2010). Local values are critical for developing adaptive strategies that have community buy-in, increasing social acceptability (Adger, 2003; Relph, 2008; O'Brien & Wolf, 2010). Local values (whether individual or collective) will shape preferences, goals and priorities for use and management of local resources or natural areas (Cheng et al., 2003).

Having people identify their values and see similarities and differences with others in their community may influence collective action for environmental governance and community-based initiatives and in the development of what Relph (2008, p.31) calls ‘locally appropriate ways to cope.’ Having shared values amongst community members can shape social capital, which can in turn influence collective action (Cheng et al., 2003; Manzo & Perkins, 2006).

Not all community members in a given place will have identical place identities and values, but rather there will likely be some commonality across sub-groups in the community. As Steele (1981) notes, certain places are so powerful as to evoke similar reactions and feelings across a number of individuals on how to interact and use a specific place. However, potential also exists for divergent views across or within community sub-groups or the community as a whole. Conflicts between insiders and outsiders can occur when place meanings clash, resulting in entrenchment of negative stereotypes (Cheng et al., 2003). Manzo & Perkins (2006) suggest that it is important to understand and recognize the diversity of meanings held by community members in a place (in their case, neighbourhoods), and that understanding this diversity can aid in fostering action among emotionally invested parties. Diversity of values regarding adaptation goals and how values shape these goals can lead to a paralysis in terms of action, and may represent a ‘social limit’ to adaptation (Adger et al., 2009). In turn, this may limit the ability of a collective group to effectively navigate current and future climate change (Adger et al., 2009). This paralysis can lead to a decreased level of community resilience (Adger et al., 2009). As such, identifying values explicitly in planning and community level initiatives can help to determine where these limits or barriers occur, and can seek to find ways of drawing out commonalities (Manzo & Perkins, 2006), so as to move forward in the most appropriate way for the largest number of people. Elucidating place meanings can help to explore why people may be



for or against certain types of activities such as development, particularly when these activities impact held meanings (Davenport & Anderson, 2005; Manzo & Perkins, 2006).

## **2.5 Chapter Conclusion**

People's relationships with place, and the bonds that emerge from such relationships, are important, and examining these relationships is a crucial aspect of developing a robust picture of the adaptive capacity of an individual, group, community or region. Understanding of subjective determinants of adaptive capacity, in concert with objective determinants and interplay determinants, can help to develop better strategies for building capacity and for addressing impacts from climate change and other exposures, such as effects of globalization.

Place theory is the broad foundation upon which this research is based. Three different strands of place theory were identified – the phenomenological, critical, and global linkages perspectives – and briefly explored, with this research taking a hybrid approach to 'place'. Subsequently, the chapter explored one of the major aspects of this dissertation, the concept of place identity, including early development and multi-disciplinary foundations. This research adopts a hybrid approach to the concept of place identity, in an effort to draw as robust a picture as possible of the relationships that people have with place. Additionally, specific place identity constructs, which are core attributes of place identity identified across a multitude of literatures, are presented and operationally defined in Table 1. These constructs were used in this research to develop and refine the methodology, which will be discussed in the next chapter.

The chapter then shifted to another of the dissertation's core concepts: adaptation and adaptive capacity. Much like both place and place identity, adaptive capacity has roots in a number of academic disciplines, ranging from biology to cultural ecology to resource studies. It

is multi-dimensional, and it is possible to draw insights on generic dimensions from across disciplinary perspectives. These dimensions were operationally defined in Table 2.

The final section of this chapter focused on bridging the constructs of place identity and adaptive capacity. As noted earlier, there is increasing recognition of the importance and validity of incorporating subjective dimensions into the analysis of what shapes adaptive capacity. As such, within this dissertation, place identity is presented as an entrée into exploring such subjective dimensions (and related sub-dimensions). The final section established the theoretical basis for examining how place identity may shape adaptive capacity. Discussions of place identity and adaptive capacity can be framed by examining perceptions and experience of exposure sensitivities, and adaptation choices. Developing the conceptual and empirical approach for investigating the relationship between place identity and adaptive capacity will be discussed in the next Chapter.

## **CHAPTER 3: METHODOLOGY**

### **3.1 Introduction**

In this chapter I present the methodological approach I used to conduct my research, including theoretical and philosophical underpinnings, methodological choices and strategy for analysis and results dissemination. This chapter is structured into four ‘areas of consideration’ that shape research: philosophical, methodological, conceptual and empirical. I address the philosophical considerations of this research first, namely the grounding of my work within a constructivist research paradigm. I then outline the overarching qualitative methodological approach in my research. I also explore the use of the case study approach for research design in this section. I then focus on conceptual considerations, and identify and develop the conceptual framework for this research, including assumptions associated with the framework. In the final section of the chapter, I outline the empirical considerations and address the choice of methods used for data collection, my data analysis strategy and the trustworthiness and quality of my research results.

### **3.2. Philosophical Considerations**

#### ***3.2.1 Constructivism as Research Paradigm***

According to Guba & Lincoln (1994), determining one’s ‘paradigm of inquiry’ involves three major questions: 1) the ontological question, which is concerned with the forms that reality can take, and what we, as people can observe and understand about the nature of reality; 2) the epistemological question, which asks what is the “nature of the relationship between the knower or the would-be-knower and what can be known”, or more succinctly, what constitutes the true nature of knowledge; and, 3) the methodological question, which addresses how the researcher

can set out to gain knowledge into the ‘reality’ they are experiencing and observing, and which will be shaped by the nature of how the researcher defines reality and knowledge.

A philosophical paradigm is inherently personal, but four commonly identified categories have emerged in many disciplines to capture the range of possible philosophical foundations: positivism, post-positivism, constructivism, and critical theory. A full discussion of each of the paradigms falls outside of the scope of this research, and readers are directed to Ponterotto (2005), Guba & Lincoln (1994), and Denzin & Lincoln (1994) for more on each paradigm. I focus here on the constructivist paradigm, which is where I self-identify. Constructivism, broadly defined, deals with how people construct their understanding of the world, and that with respect to truth and knowledge, there are multiple possible truths and many ways of knowing the world (Bodner, 1986; Guba & Lincoln, 1994; Ponterotto, 2005). According to Bodner (1986, p. 873), constructivism, as an approach to learning and instruction, “can be summarized in a single statement: *Knowledge is constructed in the mind of the learner*”. Our experiences, perceptions and understandings of the world are framed by the social environment and our personal experiences (Ponterotto, 2005). Reality, and what can be known about reality, is filtered by these experiences. Foundational links to the philosophical framing of constructivism can be traced to the work of such thinkers as Kant, Kuhn, and particularly Piaget with respect to his theory of intellectual development (Bodner, 1986; Phillips, 1995; Ponterotto, 2005).

As noted above, epistemology is concerned with the ways in which knowledge can be acquired and with what can truly be known. A constructivist perspective typically adopts what Guba & Lincoln (1994) call a ‘transactional and subjectivist’ approach to the nature of knowledge. In such an approach, the researcher is a part of the research and not removed from it, and as such influences the process of research and the findings (Guba & Lincoln, 1994). In a

constructivist approach, “the investigator and the object of investigation are assumed to be interactively linked so that the ‘findings’ are *literally created* as the investigation proceeds” (Guba & Lincoln, p. 111; emphasis in original). A constructivist researcher recognizes and embraces their subjectivity in the investigation, and makes no attempt to remove themselves from the research in the search for an ‘objective’ truth, which does not exist in the constructivist purview (Denzin & Lincoln, 1994; Guba & Lincoln, 1994; Patton, 2003; Ponterotto, 2005).

With respect to ontology, a constructivist typically takes a relativist stance on the nature of knowledge (Guba & Lincoln, 1994). Reality is seen as being constructed and mediated through an individual’s personal and cognitive constructions, biases and social experiences (Guba & Lincoln, 1994). It is experientially based, meaning that through experiences of the world, an individual can gain understanding, and through that understanding forms opinions and perceptions about the world and reality, which in turn continually shapes how a person understands and perceives the world (Guba & Lincoln, 1994; Ponterotto, 2005). The perceptions, personal constructions and biases an individual has are a function of cognitive structure, personal and vicarious experiences, and social and cultural mediating factors (Bandura, 1986). Understanding of reality can also be shared amongst multiple individuals, and even entire groups or cultures (Guba & Lincoln, 1994).

Finally, in terms of methodology, a constructivist stance tends to approach the design of research in a hermeneutical and dialectical fashion (Guba & Lincoln, 1994). Knowledge for the purposes of research can only be constructed during a back and forth exchange between the researcher and respondents/participants (Guba & Lincoln, 1994). As such, the researcher is an inherent part of the research and not separate from it. Methods and analysis often attempt to construct a final, refined, consensus (re)construction (or constructions) from the myriad

constructions explored (Guba & Lincoln, 1994). Qualitative methodology tends to be the approach of choice in constructivism-based research (Ponterotto, 2005).

### ***3.2.2 Conducting this Research from a Constructivist Perspective***

Multiple voices and multiple knowledges can tell us about the state of water and connections with place(s). Given that my research takes place in the North, in a predominantly Aboriginal community, Traditional Knowledge is an important part of how many participants define their relationships with place and the experience of changing water conditions. Traditional Ecological Knowledge is defined as “a cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment” (Berkes, 2008, p. 7).<sup>4</sup> With respect to Traditional Knowledge, “meanings and values are rooted in the land and closely related to a “sense of place”” (Berkes, 2008, p. 6). The ecological aspects of place are intertwined within cultural and spiritual practices and hold meaning with the people.

In many disciplines, including environmental and resource studies, Western science approaches to examining changes and identifying causes have often been privileged over the use of Traditional and local knowledge, which can be seen as “a challenge to the dominant positivist-

---

<sup>4</sup> Note: There are many varying definitions of Traditional Knowledge, Traditional Ecological Knowledge and Indigenous Knowledge. For some authors, Traditional Ecological Knowledge is part of broader Traditional Knowledge or Indigenous knowledge, which is knowledge held in a culturally specific fashion (e.g., Berkes, 2008). Others, for example Stevenson (1996), note that there is an ongoing dialectic between Traditional and non-traditional knowledge that ultimately shapes the broader Indigenous knowledge, and subsequently the ways people know and understand the world around them, including the natural environment (Alaska Native Science Commission, online, n.d.). In this dissertation, I will use the term ‘Traditional Knowledge’ throughout, using the Berkes (2008) definition, while recognizing the dialectic between Traditional and non-traditional knowledge. The term ‘Traditional Knowledge’ is utilized by members of the community of Fort Resolution, and more broadly throughout the NWT.

reductionist paradigm in western science” (Berkes, 2008, p. 13). More recently, however, Traditional and local knowledge are increasingly recognized as a valid and appropriate source of information regarding many aspects of natural resource management and environment (among other areas), and Traditional Knowledge and Western science are increasingly seen as complementary ways of knowing the world (Berkes, 2008). This shift has occurred across Canada, and particularly in Northern Canada where the comprehensive land claim process has been a key driver (Usher, 2000).

Scholars such as Stevenson (1996), Usher (2000) and Berkes (2008) note that there are different ‘levels’ or ‘types’ of Traditional Knowledge. Though the approaches of these authors vary, typically, Traditional Knowledge consists of knowledge, observations and experiences with the environment and the relations within it, specific knowledge, understandings of relationships within the environment (and between all parts of the environment), resource management systems and codes of ethics for use of the environment are seen as embedded within social, cultural and spiritual knowledge, systems of values and worldviews, and broader Indigenous Knowledge (which consists of both Traditional and non-traditional knowledge) (Stevenson, 1996; Usher, 2000; Berkes, 2008). Thus, for Traditional Knowledge holders, one cannot divorce observations and understanding of the environment (and people’s relationship to it) from the broader values, worldviews and culture within which they are embedded. Additionally, some people in communities may have what is considered ‘local knowledge’. This is typically described as a more contemporary or recent form of knowledge based on experiences and observations of particular places (Berkes, 2008).

In the NWT, discussions with Aboriginal communities about water and impacts to it, are typically framed from a perspective of Traditional and local knowledge. When people sit down

to discuss water, they are sharing their knowledge with you. Communities define this as Traditional and local knowledge sharing. This information may be shaped by stories passed down through generations, from cultural and social values that structure person-environment relationships, from direct experiences on the land (both short and long term), or through information shared between community members. Thus, some participants in this research are Traditional Knowledge holders (with varying degrees of knowledge) and all have varying degrees of local knowledge based on their interactions with place. Regardless of the genesis of that knowledge, people perceive and experience exposure-sensitivities and make adaptation choices informed by their experiences, what they know and perceive (knowledge), and based on influences from social and cultural contexts. Given that this is not a Traditional Knowledge study, I do not attempt to tease out what is Traditional versus local knowledge, but rather acknowledge that Traditional knowledge and local knowledge shaped the perspectives that many participants brought forth in this research.

Place and place identity are inherently personal, and often based on intimate and personal experiences (Relph, 1976; Tuan, 1978; Proshansky, 1978; Steele, 1981). Such constructions of place identity can also be influenced by social and cultural factors, as discussed in Chapter Two. Given that people experience and identify place identity in many ways, based on their own experiences and social and cultural filters, there can be no one ‘true’ place identity. As such, it is a construct that is not easily examined from positivist or post-positivist perspectives. Examining place identity is best done from a constructivist perspective, and by drawing on critical theory to understand power and politics that can define places and access to them (see Chapter Two).

In a constructivist approach, the researcher is a ‘passionate participant’ (Guba & Lincoln, 1994, p. 112) and “actively engaged in facilitating the ‘multi voice’ reconstruction of his or her



own construction as well as those of all other participants” (Guba & Lincoln, 1994, p. 115). I am an inherent part of my research, and have a passion and connection to water that has shaped how this research has evolved. I actively acknowledge my subjectivity and bias, and how they have shaped this research. Throughout the multi-voice reconstruction, I have made choices in the research design that help me to filter pertinent over less pertinent insights, by thinking critically and openly about the issues and my own socio-cultural filters. There are multiple sides to every story told within these pages, and I aim to present as many voices as possible. From these many stories and many voices, I attempt to construct the major ‘threads’ or narratives – including competing ones (which is a reality of multi-voice perspectives) – that emerge. I approached this investigation using qualitative research methodology, which is described in the subsequent section.

### **3.3 Methodological Considerations**

#### ***3.3.1 Overview of Qualitative Methodology***

Qualitative research is considered “a situated activity that locates the observer in the world. It consists of a set of interpretive, material practices that make the world visible....this means qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring them” (Denzin & Lincoln, 1994, p. 4). The key words in this statement are *interpret* and *meaning*, and emphasis on *natural settings* as opposed to experimental design (Creswell, 1998). It is these terms that drive much of qualitative methodology. Qualitative methodology focuses on the rich and diverse meanings that people assign to the world or aspects of it, and seeks to elucidate such meanings, with the

emphasis being a “complex, holistic picture” (Creswell, 1998, p. 15). The researcher is a part of the research being conducted, and has a relationship with that which is being studied (Denzin & Lincoln, 1994). Furthermore, in qualitative research there is recognition that the meanings being studied are socially constructed by participants and that this influences how the research will occur (Denzin & Lincoln, 1994). Further still, the researcher interprets the given data and constructs through their own worldview and social and cultural experiences. The values of all involved – researcher included – are front and centre in most qualitative approaches.

Qualitative methodology typically employs a multi-method technique, in order to deeply understand the phenomenon at hand, and triangulate the findings from data collection (Denzin & Lincoln, 1994; Creswell, 1998). Because the ‘objective’ nature of reality can never be truly apprehended in qualitative research (and the majority of qualitative researchers choose such methods because of this fact), triangulation via multiple methods adds richness, rigour and depth (Denzin & Lincoln, 1994).

A qualitative approach was chosen for this research because of the nature of place identity. Place identity is a personal, intimate experience, and statistical surveys and other such quantitative approaches may not entirely capture the nuances associated with such a personal concept. Attachments to place (and the factors influencing these) can be shared amongst multiple people (Steele, 1981). However, place identity is unlikely to be experienced the exact same way by different people. As such, quantitative methodologies which seek to standardize and generalize responses may not be most appropriate choice for conducting this type of research.

Finally, this research was conducted in partnership with an Aboriginal community, where story telling is a large part of cultural sharing and knowledge transmission (Kenny et al., 2004). Many of the responses about past and current events, relationships with people, animals, and

places, and spiritual and cultural aspects of land use take the form of stories, which are not easily captured in quantitative methodologies. I chose qualitative methodology, in addition to the reasons outlined above, in part to respect the cultural practice of storytelling as a mechanism for information sharing.

### ***3.3.2 Research Strategy: The Case Study Approach***

For the purposes of this research, I employed a single case, holistic research design (Yin, 2003), working specifically with the community of Fort Resolution (described in Section 3.3.2.1). The selection of Fort Resolution represents a single, exploratory case (Stake, 1995; Creswell, 1998; Stake, 2003; Dillon & Reid, 2004). Exploratory cases are appropriate when the purpose of the research is to “explore those situations in which the intervention being evaluated has no clear, single set of outcomes” (Baxter & Jack, 2008, p. 549). As a gap exists in the literature regarding the link between place identity and adaptive capacity, many of the relationships between the two are not yet explicitly or empirically defined, and as such the potential outcomes of such a relationship are not yet known. Furthermore, given that both place identity and adaptive capacity are multi-dimensional and experienced in different ways among different actors, it is unlikely that if a relationship does exist that there will be one single outcome of that relationship. It is therefore valuable to explore place identity and adaptive capacity in depth in one particular place, to first identify how such nuanced relationships may be structured and the varying outcomes that may exist. This can help to identify insights to investigate similar relationships in future Northern cases.

The case study method focuses on a particular ‘unit’ of analysis, whether a person, place, community, organization, etc. (Creswell, 1998; Yin, 2003; Flyvbjerg, 2006). The case must be

bound, in both space and time, and focus on ‘a detailed examination of a single example’ (Flyvbjerg, 2006, p. 220; see also Yin, 2003; Dillon & Reid, 2004). Yin (2003, p. 13, bullets in original) defines a case study as an inquiry that:

- “investigates a contemporary phenomenon within its real-life context, especially when,
- the boundaries between phenomenon and context are not clearly evident”.

The case study (and its requisite data) is context-dependent (Yin, 2003). It is necessary to situate the case study within its relevant social, historical and political contexts (Creswell, 1998). The information gained from a case study approach consists of thick description and analysis (Creswell, 1998; Stake, 2003). The use of multiple sources of data is a key feature of case study research (Yin, 2003). Case study approaches can utilize qualitative, quantitative or mixed methods (Yin, 1981; Creswell, 1998; Yin, 2003; Flyvbjerg; 2006). For this research, emphasis is primarily on qualitative methods.

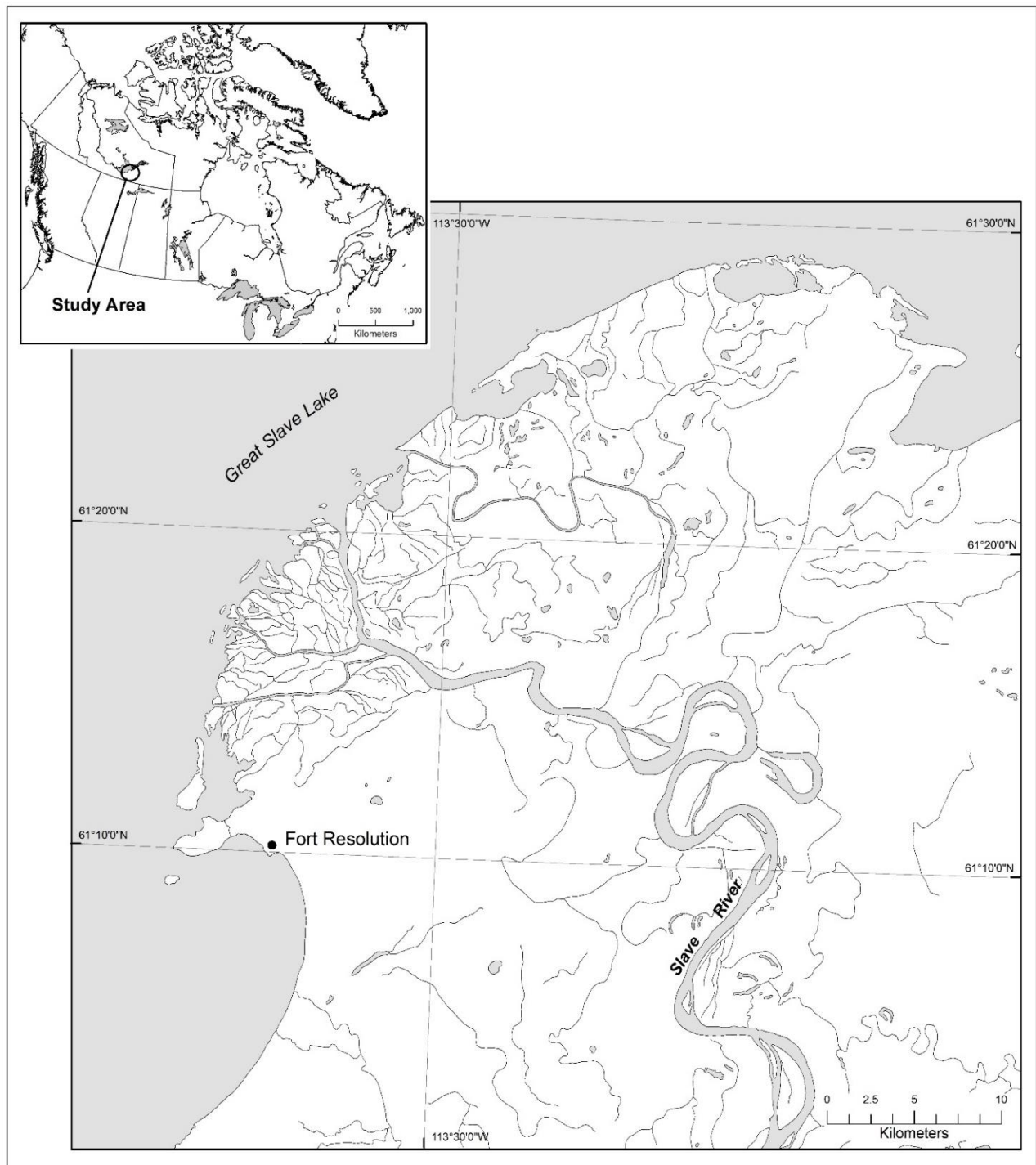
The choice of case study method is consistent with my constructivist philosophical approach to this research. Constructivist research focuses on how our experiences and culture influence the construction of reality and what we can know about something, and the importance of obtaining context-specific understanding about a particular problem, issue or place (Willis, 2007). Based on the constructivist framework guiding this research, knowledge is seen as context dependent. Engaging in a case study allows the researcher to delve deeper into issues and explore context dependent knowledge (Flyvbjerg, 2006; Willis, 2007). Constructivist research advocates the use of multiple research methods and varying data sources, which are also features of a case study approach (Yin, 2003; Willis, 2007).

### 3.3.2.1 Case Description (Fort Resolution)

The case site for this research is the community of Fort Resolution, Northwest Territories, Canada. Fort Resolution is located at 61°11'N and 113°41'W, on a peninsula on the southern shores of Great Slave Lake, with elevation ranging from 158 to 163 m above sea level (Legislative Assembly of the Northwest Territories, n.d.). As of the 2011 Census, the population was listed at 474 people (Statistics Canada, 2012). The community is home to the Deninu Kue First Nation (DKFN) and Fort Resolution Métis Council (FRMC). The DKFN and Métis traditional territories include the SRD region, which is culturally, economically and socially significant to residents of Fort Resolution, and comprises part of the larger Akaitcho and NWT Métis Nation territories (Akaitcho Territory Government, online, 2009; Northwest Territory Metis Nation, Indian and Northern Affairs Canada, Government of the Northwest Territories, n.d.). These territories are part of current negotiation processes for lands, resources and governance agreements (Indian and Northern Affairs Canada, n.d.; Northwest Territory Metis Nation, Indian and Northern Affairs Canada, Government of the Northwest Territories, n.d.; Northwest Territory Métis Nation, online, 2014)

The SRD system is an important resource for the residents in and around Fort Resolution, both historically and currently (Wolfe et al., 2007). In the region, three river systems dominate: Little Buffalo River, Slave River and Taltson River (Wesche & Armitage, 2010). Different groups within the community have historical connections to these three systems and these areas provide the community with space for traditional activities, recreation and resources (Wesche, 2009; Wesche & Armitage, 2010). In addition, Great Slave Lake (GSL) is also an important water resource for the community. The maps below locate the case site and the relationship between the case site and the SRD (Figure 1).

*Figure 1: The Case Study Region, Map of SRD and proximity to Fort Resolution*



*Maps by P. Schaus, Wilfrid Laurier University*

While initial connections between identity and water have been made, more focused research is necessary to examine the specific nature of place identity with respect to water and to reveal the links between place identity and adaptive capacity. Such research can also situate such findings in the broader contexts of the adaptive capacity literature at a theoretical level, and the NWT Water Strategy at a practical level. During my two community scoping visits and initial observations (November 2008 and July 2009), residents raised the importance of linking connections to land and water with the construction of identity. Residents suggested that:

- Water is a central component in identity construction, and important to how individuals connect with and relate to the land, both within Fort Resolution and in the greater Akaitcho Traditional Territory; and,
- Water is an important issue in terms of human rights, and community members expressed a strong desire to create a voice for water issues.

Community members are concerned about current observed changes in the region. Climate change and industrial development remain key concerns for Elders, community residents, local and regional governments, scientists and the Government of the Northwest Territories (GNWT) (MRBB, 2003; GNWT, 2008, GNWT, 2010). Fort Resolution is thus an ideal case site for this research, because of the importance of water in construction of identity, the concerns identified by community members about water changes, and the prevalence of various pressures on the system.

This research focuses on impacts of change in the Slave River and Slave River Delta (as well as the other identified areas within the Deninu Kue and Métis Traditional Territories, as well as the influence of the greater Mackenzie River Basin). However, it is important to note that deltas are dynamic ecosystems and are strongly characterized by natural change and variability

(Timoney, 2002). It is not entirely clear at this point how much of the observed change in the delta is influenced by anthropogenic climate and land use change, versus natural variability and delta dynamics (Brock, Wolfe & Edwards, 2007). All of these variables have been cited as possible explanations for the changing system. However, understanding how people perceive and experience these changes, regardless of their origin, remains a part of understanding the adaptive capacity of individuals and communities to deal with changing water conditions.

### 3.3.2.2 Ethical Considerations, Conducting Research in the North and Cross-Cultural Considerations

This research was reviewed and approved by Wilfrid Laurier University's Research Ethics Board (REB#2461). Additionally, under the *NWT Scientists' Act* (1988), all research in the NWT requires a research permit from Aurora Research Institute (ARI). As such, this research was reviewed and approved by ARI. During the review process, research license applications are sent to involved community groups for approval, prior to issuance. I also entered into a research agreement with DKFN.

Written, informed consent was required from all participants in the study. Prior to each interview, I reviewed the ethical consent form (see Appendix C) with each participant and outlined their rights as a participant. For the youth photography project, any participants under 16 also required parent/guardian consent. All data were only accessible to myself as the researcher. As per the informed consent and research agreement, the dissertation as well as transcripts and audio recordings will be archived in the community for their use<sup>5</sup>.

---

<sup>5</sup> Note: All information is protected by confidentiality and access use agreements. As indicated in the Wilfrid Laurier University (WLU) consent forms and DKFN research agreement, participant information (transcripts, recordings) cannot be used without participant permission.



I conducted this research in a primarily Aboriginal context, which means it was important to recognize inherent cross-cultural complexities as I am a non-Aboriginal researcher working outside of my own cultural context. It was necessary to be cognizant and respectful of community practices, nuances, participant timeframes and availability, and treatment of potentially community-sensitive data (Howitt & Stevens, 2005; Wesche, 2009). Being flexible and open to change, listening respectfully and long-term community engagement and trust-building have been identified as key considerations for cross-cultural research (Howitt & Stevens, 2005; Wesche, 2009).

Chipewyan is spoken by many Elders in the community. Undertaking research in a multi-lingual context can be challenging, especially when conducting interviews and focus groups in multiple languages. Additional challenges exist when words/meanings do not translate easily into different languages (i.e., specific words which may have no direct equivalent when being translated), and the potential exists for both researchers and participants to have meanings misunderstood and therefore not properly represented. To address this, Catherine Boucher, who is fluent in both languages spoken during an interview or focus group, was hired as a community researcher and interpreter to assist with translation.

Challenges and opportunities related to building collaborative research in Northern Canada have been documented (Korsmo & Graham, 2002; Gearheard & Shirley, 2007), including for Fort Resolution specifically (Wolfe et al., 2007). Specific challenges include, but are not limited to: political tensions between community groups; fluidity in group composition; ability to maintain long-term researcher-community relationships; and, research saturation resulting in community burnout (Wolfe et al., 2007; Wesche, 2009). This research built on existing community-researcher relationships and experiences of others (e.g., English et al., 1997;

Wolfe et al., 2007; Wesche, 2009), to incorporate previous collaborative efforts and identified community concerns. Preliminary scoping trips and on-going communication were undertaken to build and maintain researcher-community relationships, develop connections with community leaders and to identify interest in the project at both the political level and with individual community members. For example, pamphlets outlining the research (see Appendix D) were developed and made available to interested community members.

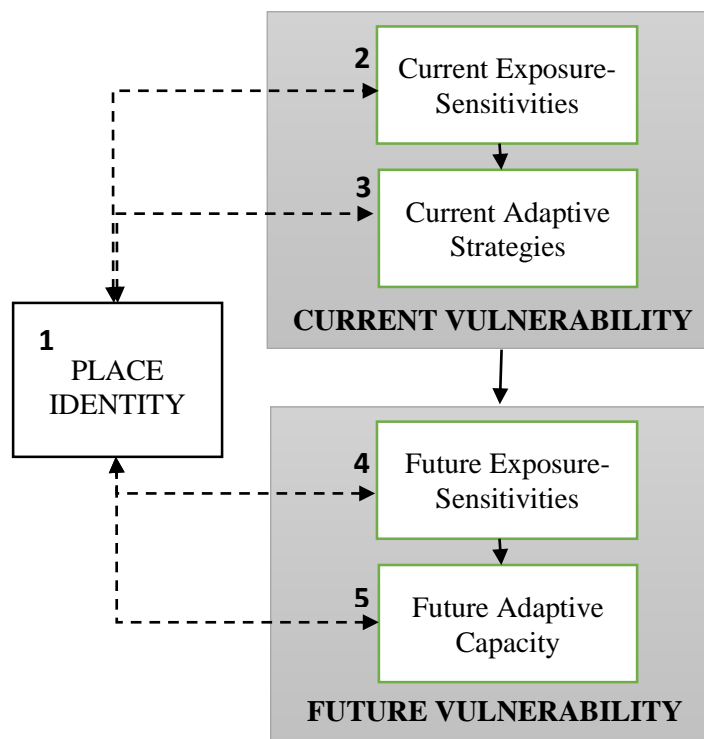
Regular reporting to the community was an important aspect of this research. Brochures with preliminary findings (see Appendix E) were developed and provided to participants, as well as DKFN, FRMC and Hamlet offices. Trip reports (see Appendix F) were developed after each field work session and sent to DKFN and FRMC. These trip reports detailed the research activities undertaken during each trip, as well as next steps. In December 2011, I presented preliminary findings to DKFN Chief and Council during a council meeting, and sat down with representatives of FRMC to review preliminary findings. Annual reporting was also provided to Aurora Research Institute as a condition of the research license for this study.

### **3.4 Conceptual Considerations - Conceptual Framework**

A conceptual framework is “a network, or ‘a plan’, of interlinked concepts that together provide a comprehensive understanding of a phenomenon or phenomena, and can guide data collection and analysis. The concepts that constitute a conceptual framework support one another, articulate their respective phenomena, and establish a framework-specific philosophy” (Jabareen, 2009, p. 51). The development of the conceptual framework for this research (Figure 2) reflects the intersection of the values-based approach and CAVIAR framework as discussed in Chapter Two (O’Brien & Wolf, 2010; Smit, Hovelsrud & Wandel, 2008; Smit et al., 2010; Wolf

et al., 2013). For the purposes of this research, I did not include all of the components of the full CAVIAR framework. Rather I drew on the CAVIAR model as an organizing framework to highlight the core aspects of adaptation and adaptive capacity that I am exploring in this research. Readers interested in the full framework and its application are directed to Smit, Wandel & Hovelsrud (2008) and Smit et al. (2010). The basis for unpacking this diagram and investigating the links between place identity and adaptive capacity is the theory presented in Chapter Two. Numbers in the diagram next to each box correspond to the text below, to highlight the analytical approach taken in this research, with the conceptual diagram as foundation.

**Figure 2: Conceptual Framework**



*Adapted from Smit et al. (2010)*

1. **Place Identity** – Drawing on the values-based approach, it is critical to first start by understanding what matters to people. Core to the first part of the framework is understanding place identity of community members (Objective 1). How do people value relationships with water and places? How do these relationships inform identity? This is discussed in Chapter Four. Place identity is posited as a potential subjective dimension of adaptation and adaptive capacity and throughout this dissertation I will explore if and how place identity informs other aspects of the CAVIAR framework.
2. **Current Exposure-Sensitivities** – Understanding what people are exposed to, and the nature of their sensitivity to that exposure, constitutes the first step of the CAVIAR framework. This is done inductively with the community to identify community-relevant and case-specific impacts (Smit et al., 2010; Hinkel, 2011). Examining the water changes that people are experiencing and how these changes are seen as impacting place identity can help to unpack place identity and change (Objective 2). In this dissertation, place identity is also posited to have an influence on how people identify and experience exposure-sensitivities, as part of the overall adaptation process (comprising part of Objective 3). Information from the instrumental record can help to characterize current exposure-sensitivities. A commentary on the instrumental record is provided in Chapter Five, though given the focus on unpacking place identity as a dimension of adaptive capacity (including shaping perceptions of exposure-sensitivities), emphasis on understanding change is framed from the community's perspective.

As noted in Chapter One, land and water (and all aspects of the ecosystem) are inseparable to Aboriginal people in Canada's north. As such it is expected that discussion

of current exposure-sensitivities will reflect this integrated relationship. Furthermore, it is anticipated that multiple drivers of water change, in addition to climate, will be discussed.

3. **Current Adaptive Strategies** – Chapter Six outlines current responses to identified exposure-sensitivities, including short-term coping responses or longer-term adaptive strategies. Core to this particular aspect of investigation is also the role and extent to which place identity may influence current choices people are making around dealing with water change, and conversely, how adaptation choices may impact place identity and values associated with places.
4. **Future Exposure-Sensitivities** – Drawing on community insights, concerns about future changes, and what these changes mean for people and their place identity are explored in Chapters Five and Six. A core question here is how current community-identified impacts to place and related threats to place identity might impact how people perceive potential future change.
5. **Future Adaptive Capacity** – understanding potential for future adaptive capacity is built on analysis of all of the above. How place identity influences future adaptive capacity can be understood by examining how place identity influences perception of exposure-sensitivities, and adaptation choices (current strategies). It can also come from (building on the analyses developed through the above framework components) examining relationships between constructs of place identity (Table 1) and dimensions of objective and subjective adaptive capacity (Table 2), drawing on inputs from multi-disciplinary literatures in the social science. This will be explored in Chapter Seven, along with insights for policy needs to foster adaptive capacity at the community level.

### **3.5 Empirical Considerations (Methods)**

This section describes the specific methods used for this research. These methods are: document review, interviews, focus groups, participatory photography and participant observation. A timeline of all research activities is included as Appendix G. This research used multiple methods to explore water resource change, place identity and adaptation/adaptive capacity. The purpose of using multiple methods for data collection is to obtain data from multiple sources to ensure triangulation, as multiple methods uncover “different aspects of empirical reality” (Patton, 2003, p. 555). This particular type of triangulation (‘triangulation of qualitative data sources’, Patton, 2003) involves comparing information from different types of sources (e.g., interviews vs. observations vs. documents) and incorporating multiple perspectives from differing groups of people. Table 3 highlights the specific methods and data sources associated with each of the three research objectives and their sub-objectives. A description of each method follows.

**Table 3: Research Methods by Objective**

Objective	Methods	Sources of Data
1. To explore individual and collective place identity in the community of Fort Resolution in relation to water	Participatory photography	<ul style="list-style-type: none"> <li>• Community youth               <ul style="list-style-type: none"> <li>○ Group discussions</li> <li>○ Photo essays</li> </ul> </li> </ul>
	Semi-structured interviews (place identity and experience of change)	<ul style="list-style-type: none"> <li>• Land users/trappers (active land use)</li> <li>• Elders (past and present land use)</li> <li>• Community members (moderate to limited land use)</li> </ul>
	Focus group (watershed change, place identity and experiences of change)	<ul style="list-style-type: none"> <li>• Land users/trappers (active land use)</li> <li>• Elders (past and present land use)</li> <li>• Community members (moderate to limited land use)</li> <li>• Environmental/water resource staff</li> </ul>
	Semi-Structured Interviews	<ul style="list-style-type: none"> <li>• Data from water change interviews</li> </ul>
2. Identify experiences of water change, impact of change on identity and related responses	Document and literature review	<ul style="list-style-type: none"> <li>• Government reports</li> <li>• Policy documents</li> <li>• Academic literature</li> <li>• NGO reports</li> <li>• News media</li> </ul>
	Semi-structured, key informant interviews to identify exposure-sensitivities	<ul style="list-style-type: none"> <li>• Elders (past and present land use)</li> <li>• Elders who are still active land users/trappers</li> <li>• Environmental/water resource staff</li> </ul>
	Semi-structured interviews	<ul style="list-style-type: none"> <li>• Data from place identity interviews</li> </ul>
3. To link place identity and adaptation	Focus group	<ul style="list-style-type: none"> <li>• Data from previous focus group</li> </ul>
	Document and literature review	<ul style="list-style-type: none"> <li>• Review of literature on adaptation in Fort Resolution</li> </ul>
	Semi-Structured Interviews	<ul style="list-style-type: none"> <li>• Data from all interviews</li> </ul>

### ***3.5.1 Document and Literature Review***

Documents and literature “constitute a particularly rich source of information” and can often provide information that cannot be readily observed (Patton, 2003, p. 293). In addition, Creswell (2003) notes that documents can provide the words and voices of people in written form and may represent ‘thoughtful’ data, in that careful attention is often given when committing ideas and information to text. Documents and literature can also be an unobtrusive form of data collection, when documents are publically available (Creswell, 2003). As part of my research, I reviewed key pieces of literature and available documents (see Table 3 for list of document types) to help generate the semi-structured interview questions and focus group questions, based on constructs of place and place identity, types of water change occurring in the region (including related identity impacts), and broad framings of adaptation and adaptive capacity. This review was also useful to illuminate a broad range of themes related to this research, and to supplement interview, focus group and participatory photography data, around the themes of water change, place identity and adaptive capacity. Sources that reflected both Traditional and local knowledge and Western science were included in this review.

### ***3.5.2 Semi-Structured Interviews***

Semi-structured interview approaches allow a researcher to gain insights that may not be available from other methods and which may not be directly observable (Patton, 2003). Interviews capture the voices and ideas of the participants, and allow the researcher to gain insight into feelings, emotions, stories and life experiences from the participant’s own perspective (Patton, 2003). Semi-structured interviews also allow for the co-construction of



meanings and data, through a process of ‘collaborative meaning-making’ (Doucet & Mauthner, 2008). Semi-structured interviews are an excellent method for capturing the rich data, life experiences and stories which articulate and illuminate place identity.

Semi-structured interviews were used in this research in two ways. Firstly, key informant interviews (see Table 3) were conducted to identify observations and concerns surrounding water change and identify exposure-sensitivities, to complement the secondary data collected through document and literature review (Objective 2)<sup>6</sup>. Secondly, semi-structured interviews were conducted with a wide range of community members (see Table 3) to determine place identity as related to water, and the impacts of environmental change on place identity (Objective 1). These interviews explored meanings and values, as well as experiences of loss and impacts to well-being (among other key themes). One set of questions was developed for the water change interviews, and one for the place identity interviews (though there was significant overlap between the two sets of questions). Interview questions were reviewed and revised with community researchers to ensure appropriateness, and to identify additional questions to be added (see Appendix H for both the original interview guides and revised guide). Interviews were concluded when it was determined that information provided was reaching saturation. For many of interviews with Elders, an interpreter assisted the interview process, though the majority of these interviews were conducted primarily in English. Finally, an effort was made to interview roughly equal numbers of Dene and Métis participants.

---

<sup>6</sup> Note: though the primary purpose of the key informant interviews was to specifically identify changing water conditions, participants were also asked about place identity and values, though these parts were less emphasised. Similarly, for broad community participant interviews, participants were asked questions about changing water conditions in addition to place identity. This was part of determining impacts of change, but data obtained from these interviews supplements findings from the key informant interviews. All participants were asked about possible actions for dealing with watershed change, to begin to address adaptive capacity.

Interview selection followed a multi-pronged approach, in order to capture as many broad-ranging community experiences and perspectives as possible. For key informant interviews, environment staff at DKFN, FRMC and Akaitcho were approached and asked to participate in interviews, to offer their perceptions and insights on water change. The majority of the Elders were identified by DKFN and FRMC who provided names of Elders who had significant experience on the water and land and who could speak to what conditions were like in the past and how they has changed. In one case, I was also able to interview an additional Elder alongside his spouse, thus including a participant not previously identified. While these key informant interviews were used to assess exposure-sensitivities, based on expert experience, all interviewees regardless of experience were asked if they felt water resources (quality, quantity, etc.) in the area had changed and in what ways.

Selection of participants for the broad community interviews proceeded in a variety of ways. Firstly, key informants identified additional people that I should talk to, and these people were approached for availability. Secondly, I had conversations with staff at both DKFN and FRMC to identify additional participants. One Elder who had been identified for the first round but not interviewed, was interviewed at this time. Additional participants were identified by my community researchers, who identified people with ranges of land use, cultural and traditional activities. Participants also often offered additional names of people to talk to. Finally, to ensure I was also accessing people in the community who were not identified by the above (to make sure I was capturing multiple voices, and not missing people due to social biases), I approached people in the community directly to ascertain interest in participating in an interview.

Community members often volunteered names of key people to talk to. The resultant interview

list reflects a wide range of ages, experience levels and knowledge, as well as both men and women.

**Table 4: Summary of Interviews and Participants**

Type of Interview	Demographic	Number of Interviews	Purpose	Link to Objectives
Key informant, semi-structured interviews	<b>TOTAL KEY INFORMANT</b>	<b>N = 16</b>	Main purpose: to identify water changes	Primarily linked to Objective 2, but also provided data for Objectives 1 and 3
	Elders	N = 5		
	Elders who are active land users	N = 6	Secondary purpose: to identify experiences of place identity and impacts of change	
	Environment and water resource staff (local and regional)	N = 5		
Broad community-based, semi-structured interviews	<b>TOTAL COMMUNITY PARTICIPANT</b>	<b>N = 33</b>	Main purpose: to identify experiences of place identity and impacts of change	Primarily linked to Objective 1, but also provided data for Objectives 2 and 3
	Elders	N = 11		
	Elders who are active land users	N = 1	Secondary purpose: to identify water changes	
	Active land users/trappers	N = 9		
	Community participants (range of land use, from moderate to limited/no land use) <sup>7</sup>	N = 12		
Overall Totals	<b>TOTAL INTERVIEWS</b>	<b>N = 49</b>		
	Elders	N = 16		
	Elders who are active land users	N = 7		
	Active land users/trappers	N = 9		
	Community participants (range of land use, from moderate to limited/no land use)	N = 12		
	Environment resource staff (local/regional)	N = 5		

<sup>7</sup> Note: Community participants ranged from moderate land use (i.e. some subsistence or commercial harvesting; recreational activities, etc.) to limited/no land use.

Interview questions for both key informant semi-structured interviews and broad community participant semi-structured interviews were designed to address each of research objectives identified in Chapter One (please see Appendix H for the interview guide). For Objective 1, interview questions were developed for the broad community participant semi-structured interviews. Questions for this objective focused on place identity and importance of water (Chapter Four), and how changing water conditions may be impacting place identity. (Chapter Six). These questions were developed based on review of the place identity literature (e.g., place identity constructs, Table 1, Chapter Two), and based on the conceptual framework above. Questions started broadly ('water' generally) and became more focused through the interview (from the SRD and GSL as a whole, to specific place(s) of importance to the interviewee). However, it is important to note that some individuals chose to focus on water broadly throughout the interviews (rather than specific place) and this was accommodated.

To address Objective 2, interview questions for key informants focused on community-identified changes in water quality and quantity (as well as broader aquatic ecosystem health), in historic, current and future timeframes (Chapter Five). Determining how people perceive the problem is necessary for understanding how they feel changes may impact them and what actions may be taken to address them. It is also necessary to understand where changes may be perceived to stem from (drivers of change). While the majority of information on water change was obtained from the key informant interviews, community participants were also asked about water change, as part of understanding their experiences of change. As such, information from these interviews was also used in Chapter Five to document watershed changes.

Additional questions around collective identity and collective action, as well as adaptation behaviours, were also included in both key informant and broad community

participant interviews. Such questions were designed to contribute to Objective 3, related to dimensions of adaptation and adaptive capacity and the role of place identity in shaping these dimensions (Chapters Six and Chapter Seven).

Throughout the dissertation, I have noted whether participants are Elders, active land users or trappers, community members, youth or environmental staff. The majority of participants who were not Elders or youth fall roughly within the middle-aged portion of the community. Thus, unless additional identifying information is provided, it should be assumed that participants are approximately middle-aged.

### ***3.5.3 Focus Groups***

Focus groups are interactive, and allow for the negotiation and discussion of concept meanings between participants (Doucet & Mauthner, 2008). This particular method can “enable the researcher to examine people’s different perspectives as they operate within a social network, and to explore how accounts are constructed, expressed, censured, opposed and changed through social interaction” (Kitzinger, 1994a, p. 159; also cited in Swain, 2006). The purpose of using a focus group is to gather a wide variety of information (including shared and diverse views) and to allow people to expand on their responses through interaction with other people (Patton, 2003). Researchers can obtain “high quality data in a social context where people can consider their own views in the context of the views of others” (Patton, 2003, p. 386). The nature of interaction between people is a key part of the data collected when employing focus groups as a method, and it allows the researcher to determine shared meanings (Kitzinger, 1994b; Kitzinger, 1995). Focus groups also permit the researcher to acquire a large amount of data in a short time-

frame and cost-effective manner (Kitzinger, 1994b; Kitzinger, 1995; Patton, 2003), while accessing the perspectives of multiple participants.

One focus group was utilized to explore observations of water change, water-related place identity, impacts to place identity from water change, and opportunities for action (what should be done to address change). Focus group guiding questions are included in Appendix H, and followed a structure similar to the semi-structured interview questions.

Focus group participants were solicited broadly. A poster was put up in key places in town advertising the focus group and seeking participants. Interested participants were asked to call their local Band or Métis office to sign up. An equal number of spaces were reserved for DKFN and FRMC participants, and one additional participant (employed with one of the community groups) took part. Broad solicitation was used to ensure a cross-section of participants with varying degrees of place identity, land experience and opinions about environmental change. This was also done to identify individuals who were keen to discuss water, and who may not have been identified through the interview selection process.

The focus group consisted of eleven individuals from the diverse sub-groups in the community (Table 5). Two community researchers assisted with facilitation of the focus groups (e.g., note taking and question facilitation, etc.). Information obtained from the focus group contributed to results presented in Chapters Four through Seven.

**Table 5: Focus Group Participant Composition**

<b>Demographic</b>	<b>Number of Participants</b>
<b>TOTAL PARTICIPANTS</b>	<b>N = 11</b>
Elders	N = 3
Elders who are active land users	N = 2
Active land users/trappers	N = 1
Community participants (range of land use, from moderate to limited/no land use)	N = 4
Environment and water resource staff (local)	N = 1

### **3.5.4 Participatory Photography**

Participatory photography was used to explore the relationship that community youth have to water and place, as well as address how they see water changing. The method involves using photography to document the voices of often under-represented populations, including youth. Wang and Burris (1997, p. 369) state that “Photovoice is a method by which people can identify, represent, and enhance their community through a specific photographic technique.” It is designed to be emancipatory and is an alternative way for addressing key issues. It is typically used for community development related research, to identify issues and concerns and opportunities within the community (Strack, et al., 2004).

Youth are often underrepresented in environmental change research, and given that they have important contemporary knowledge and insights, and are the future leaders in their communities, their voices should be included in research focused on changing environmental conditions (Fresque-Baxter, 2013). Photography offered a youth-centric approach to engaging young people in this particular research project, in a way that was hands-on and creative.

Working with teachers at Deninu School, a photography program was developed for two classes that linked into existing classroom curriculum objectives. In the Grade 7-8 class, photography work was tied to the literacy unit, using photos as a springboard for composing different types of writing. Students had to choose a role, audience, format, topic and strong verb, and create a piece of writing using a photo of the water as the foundation for the piece. With the Grade 11-12 students, the photography was used as part of the social studies unit, which focused on identity, nationality and Indigeneity, and what it meant to students ‘to be from the north’ (Fresque-Baxter, 2013). The Grade 11-12 students also focused on questions about what water and the land meant to them. The Grade 11-12 students composed photos essays on these themes.

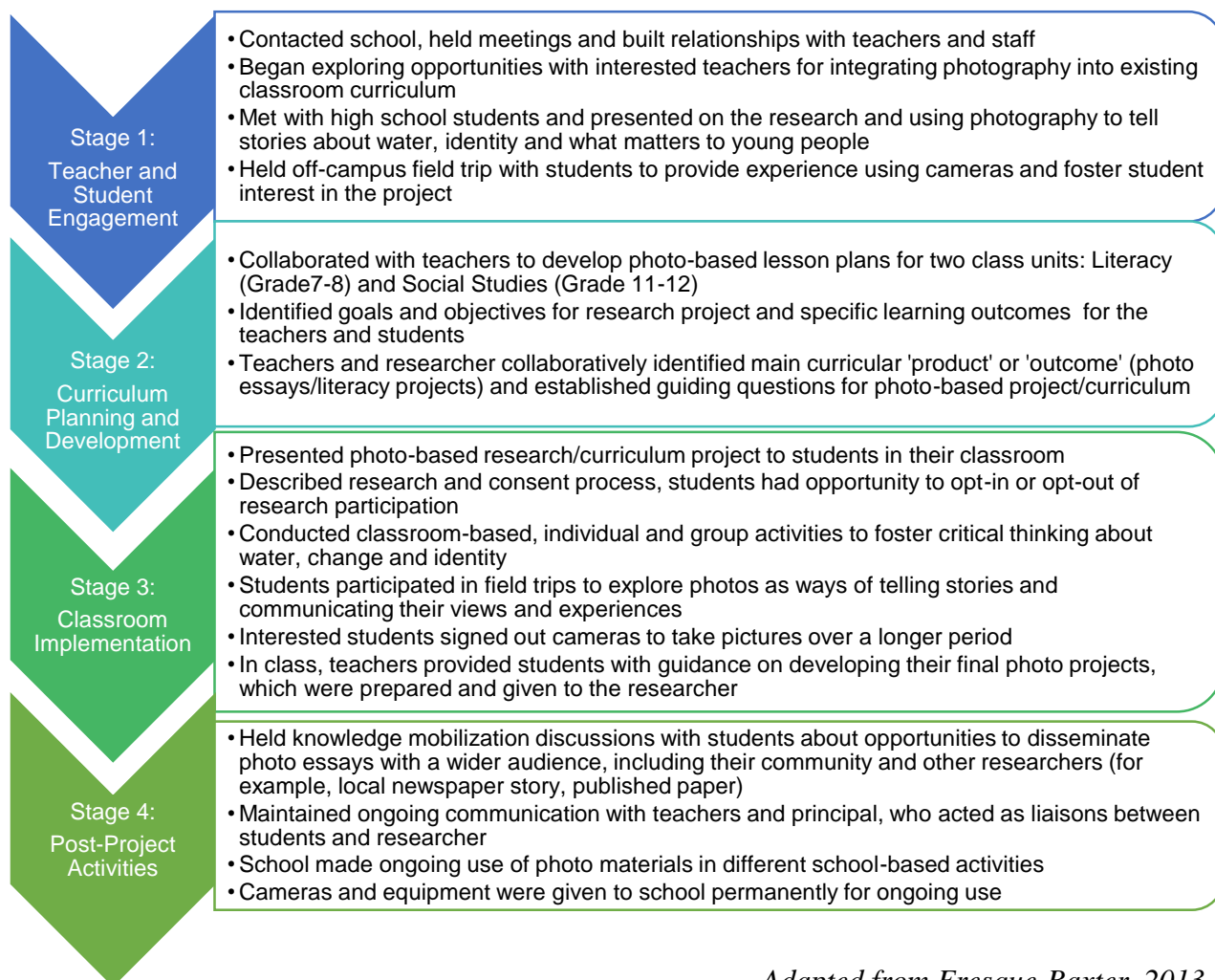
All students in the class took part in the photo project as part of their classroom units, but not all students opted to have their photos and experiences captured in my research project. Students were in no way penalized in the classroom for their choice to participate or not participate. I, along with the teachers, reviewed the project with students, including the ethical consent process. All students were asked to sign consent forms (see Appendix C). Forms were left with students to review again with their teacher or with their parents/other adults. For students under the age of 16, a consent form for parents/guardians was sent home for signature. In the Grade 7-8 class, of roughly 12 students in the class, four consented to participate in the research portion. For the Grade 11-12 students, of roughly 15 students, nine consented to participate in the research portion. In the end, five students submitted photo essays to contribute to the research project. The process for developing this portion of the research is depicted in Figure 3. All students who chose to participate submitted photos with written work, which was analysed for the purposes of this research. Youth submissions are included as Appendix I.<sup>8</sup>

---

<sup>8</sup> Note: Grade Seven and Eight students submitted large posters of their photos and writing. As such, re-typed written portion and photos of their submissions are included in Appendix I.



**Figure 3: Process of Developing Participatory Photography Project**



*Adapted from Fresque-Baxter, 2013*

### **3.5.5 Personal Experience/Observation**

Another aspect of my research methods was the use of personal experience/participant observation. As a constructivist, qualitative researcher, I am a part of the research process, and my experiences and social constructions shape both the research process and the interpretation of findings. Additionally, this research was conducted in a collaborative manner, and as such, my

dialectic interactions with the community of Fort Resolution have shaped the research. To acknowledge this belief, and recognize my own subjectivity as a researcher, personal experiences and participant observations were a part of my methods for collecting data.

Observation involves recording and reflecting on one's surroundings and what one hears, sees, smells and feels during field work in a natural setting (described above as a component of qualitative inquiry) (Creswell, 2002). Observation can range from being on the outside looking in ('complete observer') to being a full participant in the study ('participant as observer'), with a range of variances in between (Creswell, 2002). Participant observation is a strategy that Denzin (1978, p. 183) describes as one that "simultaneously combines document analysis, interviewing of respondents and informants, direct participation and observation, and introspection".

Participant observation is blended with the other field methods and is inseparable from them, providing a richness and contextualization to results from the other means of data collection.

In the case of this research, I engaged in my research as a full participant in the setting. I lived in the community of Fort Resolution, and participated in land-based activities, trips into the Slave River Delta, and learned to set hooks for fish on the lake ice; all of these activities gave me insight into the importance of water and how it is changing. Some of my insights and analyses in this research stem directly from these experiences. Furthermore, I participated in non-land based activities in the community as well, from attending public meetings to dancing jig at the winter Carnival, from supervising youth dances to making pancake breakfasts for Elders. These activities provided opportunities for engaging in discussions with community members and in strengthening community-researcher relationships.

Insights obtained from observation and experience in the community are included throughout Chapters Four through Seven. Observations and experiences included are high-level

observations based on my experiences in the community, and are provided to supplement and contextualize findings from semi-structured interviews, the focus group, participatory photography and document/literature review. They are not intended to be stand-alone findings.

### ***3.5.6 Data Analysis***

Findings from all data sources were systematically analysed in a multi-phase process. This process involved reviewing data, memo-writing, multi-level coding, and analysis of findings in the context of the antecedent literature. The process for data analysis is described below. Though presented in linear fashion below, it is important to note that data analysis is an iterative process, and my analysis moved back and forth across the 'steps' throughout the process. Initial analysis began broadly, and became subsequently narrower and more focused as the analysis process proceeded.

The first step of the process was reviewing key documents and literature. Analysis of these sources was broad, and was designed to identify broad themes and concepts related to watershed change, place identity and adaptive capacity. Broad themes helped to frame subsequent analysis of other sources (described below), and information obtained through this process was used to supplement and contextualize findings from semi-structured interviews, focus groups and participatory photography.

Audio recorded interviews and the focus group session were manually transcribed. Interview and focus group notes (including from participants who opted not to be recorded) were also transcribed. All transcripts were loaded into QSR N\*Vivo, a qualitative data management software program.

Transcripts were initially reviewed broadly. The purpose of doing this was to reflect on emergent themes, identify potential constructs, and highlight key quotes that could potentially help frame the story (Patton, 2003; Saldana, 2009). Analysis then proceeded through First Cycle coding (Saldana, 2009). I first determined four broad structural codes. Each of these codes was linked to the research objectives to ensure that the analysis process addressed the objectives. These structural codes were: water change (Objective 2), place identity/place relationships (Objective 1), experiences of change (Objective 2) and actions/dealing with change (Objective 3). Interview and focus group transcripts were then broadly open coded, using these structural codes as an analytic frame. Open coding was employed to identify any emergent themes related to these structural codes, and to allow participant voices to speak through the data. Open coding was done to capture participant experiences holistically. This open coding process led to several hundred codes. These codes were then reviewed and refined, and similar codes grouped together under broader thematic codes ('axial coding') (Patton, 2003; Saldana, 2009). Where appropriate, thematic codes were also grouped together under larger umbrella theme codes (the aforementioned structural codes) that were linked to the broad structural codes. This process was done several times, until it was determined that all similar codes were grouped together, and a hierarchical structure of themes, sub-themes, codes and sub-codes had been developed.

For place identity themes, the initial codes are used to frame the presentation of findings in Chapter Four. This was done to explore the nuanced ways people in Fort Resolution experience place identity, and to ensure multi-voice construction of place identity (as described in Chapter Two, as part of a constructivist paradigm). Additional analysis conducted on place identity themes is also included in Chapter Four, and will be described below.

Coding then proceeded through a systematic Second Cycle coding process (Saldana, 2009). The purpose of this second cycle process was to refine the existing code structure, with specific emphasis on framing and assessing participant experiences in the context of place identity and adaptive capacity. Specifically, this process drew on identified place identity constructs (Chapter Two), identified adaptive capacity dimensions (Chapter Two), and the developed conceptual framework (Figure 2, this Chapter). Analytic memo-writing was conducted throughout this process to identify insights into linkages between codes and broader concepts of place identity, experience of change and adaptive capacity.

The place identity themes identified above were first coded using the place identity constructs (Chapter Two) as sensitizing concepts. This process revealed how place identity constructs, as identified by the literature, are situated and exist within holistic person-place experiences, as described in Chapter Four. Examples of these constructs are included in Chapter Four. Experiences of change were coded using key concepts synthesised from the place literature, including nostalgia/yearning, sadness, anger, grief, wellbeing, fear/uncertainty, and (mis)trust. Data from experiences of change were also coded using place identity constructs to identify impacts of loss on place identity. This helped to identify the nature of how people are experiencing place-related change, and the impacts related to such change. This process refined the existing codes for experiences of change and are used to frame Chapter Six. Actions/dealing with change was then coded for adaptive capacity dimensions using the dimensions identified in Chapter Two as sensitizing constructs. This allowed me to determine what dimensions were present (or not present), and how these dimensions were enabled or constrained in the context of water change in Fort Resolution. Findings on dimensions of adaptive capacity are presented in

Chapter Seven. The dimensions codes were then assessed in relation to place identity and loss constructs.

Assessment of the linkages between place identity, experience of change and adaptive capacity was completed using empirical evidence presented in Chapters Four through Seven. Specifically, within each of the dimensions of adaptive capacity that emerged (Chapter Seven), empirical insights gleaned in Chapters Four, Five and Six were used to explore the relationship between place identity and adaptive capacity, through the lens of the antecedent literature presented in Chapter Two.

The participatory photography portion of my research was designed specifically to better understand youth place identity (Objective 1; primarily the Grade 11-12 students) and their experiences of change (Objective 2; both classes). I analyzed outputs from the photography project using place identity and broad water change (e.g., past, present, future, and drivers of change) constructs as sensitizing codes, as well as the major place-value codes identified in the analysis of interviews. During writing of results, findings from the photography portion were brought together with the emergent themes from other data sources. This highlighted that the place identity experiences and concerns of community youth are very similar to the experiences and concerns raised by older community members.

The results of the above analysis process were then compiled and woven together to tell the story of place identity, experiences of water change and adaptation and adaptive capacity in Fort Resolution. Quotations from interviews and focus groups, as well as excerpts from the written youth photography project, are included to help tell the story from first-person perspectives and to add richness and description to support the researcher-identified themes. Quotations were chosen for inclusion where they clearly demonstrated (based on the coding

process) the theme being discussed. Individual quotations were included from participants who consented to their use. Names are included where participants consented to their use, otherwise quotations are attributed anonymously. I attempted to include quotations throughout this dissertation from a wide range of participants, where possible, to ensure multi-voice perspective and capture the range of nuanced experiences (including experiences that are contrary to the major emergent themes). However, some key individuals captured more of the themes or provided more comprehensive description and detail, and as such have more attributed quotations throughout.

### ***3.5.7 Ensuring Trustworthiness***

Research inquiries are judged based on quality and trustworthiness or rigor of the findings (Patton, 2003). For ‘traditional inquiries’, which are typically objectivist, quantitative research, criteria used in such an evaluation include objectivity of the researcher, validity of data (both internal and external), strength of evidence, reliability and generalizability (Patton, 2003). Given that constructivist research approaches research questions and design differently, different criteria must be used to assess quality and trustworthiness (Krefting, 1991). Typically, constructivist, qualitative research can be assessed for trustworthiness using the following key parameters: acknowledgment of subjectivity; credibility; and transferability. Each of these parameters is explored in greater detail below, including how each was addressed in this study, to ensure high quality and trustworthiness in the research findings.

As identified earlier in this chapter, subjectivity is an important part of constructivist research, in that the researcher does not separate their biases from the research. At the outset of this dissertation, I highlighted my own subjectivities associated with the research at hand,

including the role of water in my own life. This is carried throughout the research through the choice to include participant observation as part of the research methodology. Participant observation brings the experiences of the researcher directly into the process as an important aspect of discovery of the lived experience. Engaging in reflexive practice as a researcher helps to strengthen the quality and trustworthiness of a research project (Krefting, 1991). In Chapter Eight I return to and contextualize my experiences as a researcher in Fort Resolution.

Credibility deals with confidence that the findings have some degree of truth “for the subjects or informants and the context in which the study was taken” (Krefting, 1991, p. 215) This does not mean uncovering a universal truth, as there can be no one truth, but rather ensuring the research findings capture the lived experience of a particular phenomenon by research participants (Krefting, 1991). Constructivist approaches aim to foster dialogue among multiple viewpoints and perspectives, rather than develop a single objective truth (Patton, 2003). This means presenting themes and findings that emerge strongly or across many participants, but also exploring ideas, concepts and themes that may be raised in only one interview or by a small handful of people. All experiences and themes, given the constructivist approach, are important in telling the story of place identity and adaptive capacity and Fort Resolution.

In this research, credibility is addressed through a member checking process, whereby I met with participants to review how the interviews had been interpreted and coded, and the specific quotations or information used from each participant. This allowed participants to add or change their descriptions of environmental change and place identity and to determine if the interpretation of the results did indeed accurately capture their experiences. All of these practices work together to ensure credibility of the findings.



In the presentation of findings throughout this dissertation, thick description is used to “take readers into the setting being described”, so that readers can “understand the phenomenon being studied and draw [their] own interpretations about meanings and significance” (Patton, 2003, p. 437 - 438). Quotations are also used throughout this thesis in an effort to contextualize the findings in participants’ own words and complement the thick description. This allows participants to recognize their own thoughts and assess the validity of the interpretation (Krefting, 1991), as well as allows other readers to draw conclusions about the findings based on participant descriptions.

Credibility can also be ensured through the use of triangulation (Krefting, 1991), and multiple methods were used throughout this study towards this end. In this particular research, multiple methods (‘methodological triangulation’) and multiple sources of data (‘data triangulation’) (Patton, 2003) were used to explore place identity and water resource change in order to compare results from methods and sources against each other so that consistencies or differences could be identified. Additionally, as different methods reveal different parts of the phenomenon empirically, and different sources provide different interpretations and perspectives about the experience of a phenomenon, triangulation in this research contributed to the development of a robust picture of place identity, change and adaptive capacity in Fort Resolution (Patton, 2003).

Transferability refers to the ability of the results (or parts thereof) of the study to be applicable in some degree to other contexts, if those context share enough similar variables (Krefting, 1991). There is recognition within qualitative research that results can often not be generalised outright to other cases because research is undertaken in a naturalistic setting, and because lived experiences and phenomena are contextually-dependent (Krefting, 1991).

However, if other cases share similar contexts, lessons learned from one study may be applicable or comparable to another case. For example, aspects of this research, particularly experiences of changing watersheds and the impacts on communities related to such changes, are commonly experienced across the NWT, and it is likely that some of the insights gleaned from Fort Resolution are applicable in other small, resource-dependent communities that share a similar cultural makeup. However, such experiences may not apply to larger urban NWT centres such as Yellowknife where there is less direct, traditional resource-dependence and a more diverse cultural fabric.

All of the above strategies are utilized in this thesis to ensure high quality work, credibility of the findings and of the interpretation of such findings, and to ensure the overall research is trustworthy and rigorous.

### **3.6 Chapter Conclusion**

This chapter presented the methodological approach and framework that guided my research. The chapter proceeded through four areas of consideration: philosophical, methodological, conceptual and empirical. These considerations resulted in choices made about how this research was designed, conducted, analysed and presented. In the first part of this Chapter, I addressed the philosophical considerations associated with my research. As part of the constructivist paradigm, multiple voices, including my own, are presented throughout Chapters Four through Seven. This not only provides richness and rigour, but allows readers to assess my analysis and interpretation of the findings.

The second section focused on the methodological considerations of my research. To explore place identity and its relationship to environmental change and adaptive capacity, I chose to focus on a single, in-depth case study, situated in Fort Resolution. This allowed me to explore the wide-ranging nuances of place identity experiences (Chapter Four) and how these experiences are impacted by change (Chapter Six). In Chapter Seven, these experiences are woven together to examine the relationship between place identity and adaptive capacity. Focusing on one case allowed full treatment of the themes for each of the overarching concepts, as presented in the subsequent chapters. A detailed, comprehensive analytical coding process has revealed key insights related to the experience in Fort Resolution.

Building on the literature review of key concepts in Chapter Two, the third part of the chapter focused on the conceptual aspects of this research that were used to develop the study and to analyse and interpret the findings. The specific methods chosen for this, as well as the strategy for analysis (the fourth part of this chapter), revealed unique experiences specific to Fort Resolution, presented in the subsequent chapters.

## **CHAPTER 4: CONNECTIONS TO WATER AND PLACE – EXPLORING PLACE IDENTITY AND PLACE-BASED RELATIONSHIPS**

### **4.1 Introduction**

The purpose of this chapter is to examine the relationships that people in Fort Resolution have with place, focusing on relationships with water and how such relationships shape identity. This chapter addresses research Objective One (see Chapter One). This chapter is structured as follows. The first six sections explore the relationships with place and water as identified by community members in Fort Resolution, through six key emergent themes (Figure 4). In order to allow participant experiences to be represented, data were coded for emergent themes related to how and why people develop relationships with water and key places (see Chapter Three). Each theme contributes to the overall experience of place identity for community members in Fort Resolution. Key place identity constructs (see Chapter Two) are also identified and discussed for each emergent theme, to demonstrate how place identity is experienced and structured through these person-place relationship themes (see discussion regarding this in Chapter Three). It is important to note that the themes are loose and fluid categories, and the experiences captured within those themes represent a wide array of place identity experiences. Not all person-specific experiences have been included, as this would be beyond the scope of what can be included in this dissertation.

The final section of this chapter focuses on the concept of scale as related to place identity. This is explored through the experience of place identity as ‘transcendental’, in that the experiences that people in Fort Resolution have are intimately connected to experiences in other communities. Connections to communities dealing with similar challenges, and connected by

similar water-based relationships and culture (most notably the community of Fort Chipewyan), was an important aspect of the place identity experience for many community members.

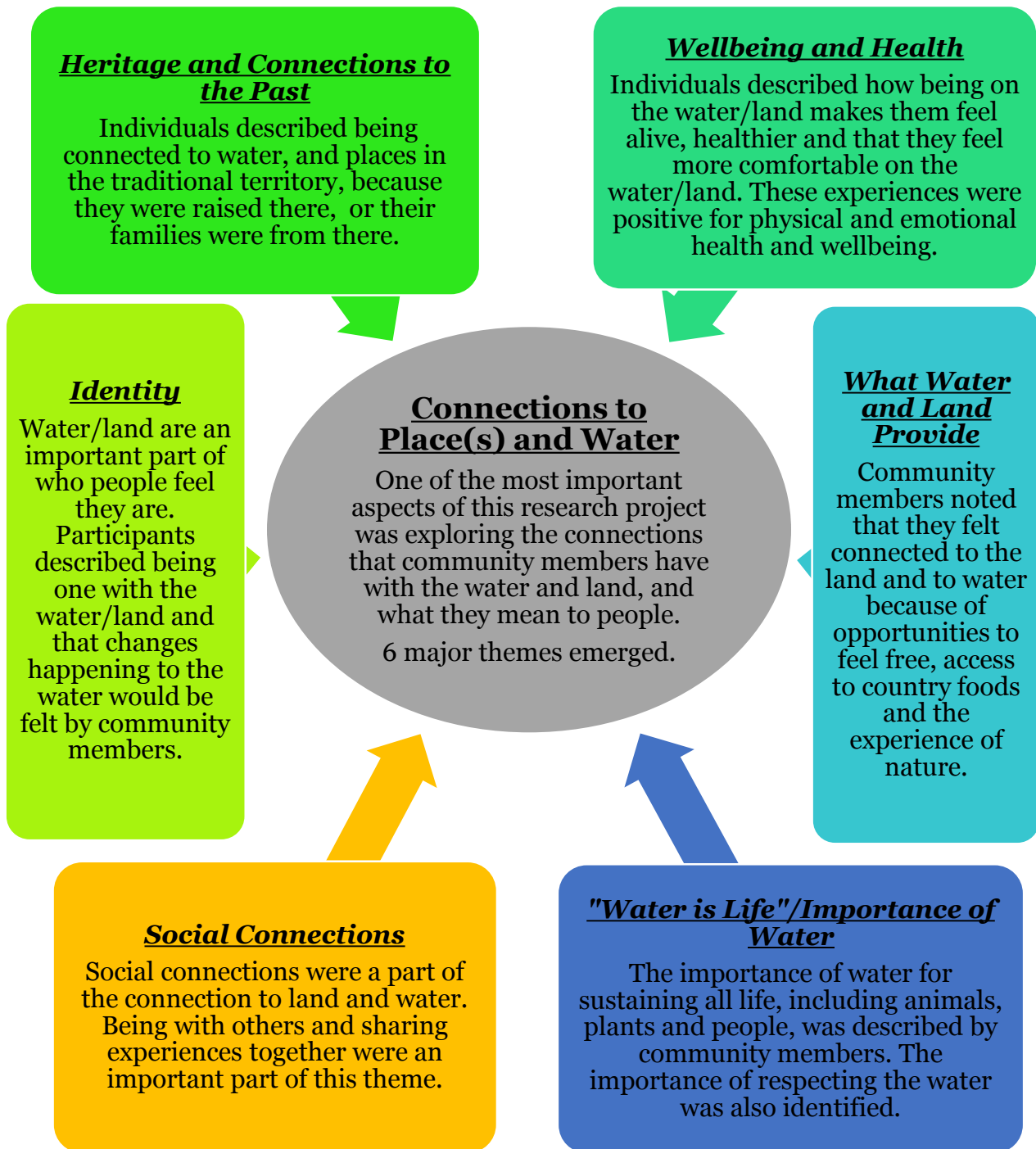
The information presented in this chapter is drawn from all semi-structured interviews, the focus group, participatory photography, participant observation and key documents. Multiple participant perspectives are included, so as to ensure multi-voice representation, which is key for a constructivist research paradigm (Chapter Three). As noted in Chapter Three, all quotations and photographs were used with consent from participants. Names are used where consent was given, otherwise they are attributed anonymously. Where desirable and/or possible,<sup>9</sup> quotations and interpretations were cross-checked with participants. Where necessary, some minor edits were made to quotes for ease of reading and length. For each major theme, the number of respondents who discussed this theme are identified, in order to give sense of strength of each theme in relation to the overall place-identity experience.

It is also important to note that ‘place’ and ‘water’ are considered in two different ways in this chapter. Originally the intent was to focus on specific, special places that matter to people and link to overall water in a more high-level way. However, it became apparent during the interviews that most people focused on the idea of ‘place’ and water broadly – thinking of it more as ‘the land’ or ‘the bush’. Some people chose to discuss specific places, and these are noted where applicable. Furthermore, as noted in Chapter One, water and land are inseparable, with water as a connecting thread through all parts of the environment. As such, when people ask about connections to water and place, answers are framed in a broad, holistic perspective, and results are presented in this chapter accordingly.

---

<sup>9</sup> Note: in some cases, participants had passed away between the time of interview and the writing of this dissertation. In such instances, immediate family members were approached for permission to use quotations in the dissertation. Participants were given the opportunity to cross-check quotations and interpretations and some chose not to, but indicated that they were fine with information and quotations being included in this dissertation.

Figure 4: Emergent Constructs and the Relationship to Connections with Place/Water



Sources: Key informant interviews, focus group, community interviews, participatory photography

## 4.2 Heritage and Connections to the Past

For 23 people, connection to the past, their heritage and their culture, was a critical aspect of their experiences with water, land and specific places. The theme of heritage and connections to the past was also a prominent part of the focus group. Being out on the land made people feel connected to their ancestors and to family members, or it was a conduit to connect with or enact aspects of their culture (e.g., hunting, trapping, etc.). For many, responses about culture were intertwined with their experiences with family members out on the land. Often, the places people described (or even the ‘bush’ in general) were places that they had grown up, or had spent a lot of time at throughout their lives – and many still continue to spend time at these places. When asked about whether he likes to spend time on the land, and why it is important, one participant (Anonymous, pers. comm., 2011a) provided the following explanation:

*Yes ma'am, part of my culture I guess. Hunting and... well that's what the people used to do before, a long time ago, so, they didn't have anything that we got today, like TVs and stereos and whatever... I used to go out with my grandfather. He taught me like, how to deal with the water and how to go hunting for animals. And how to trap and stuff. He taught me just about everything I guess.*

For this participant, being out on the land is a link to his Dene culture, and a connection to his grandfather. Darwin Unka (pers. comm., 2011) described a very similar experience:

*Darwin: Yeah, I grew up most of my life on the land. My dad taught me how to hunt, fish and trap...that's all I know how to do...I'm an urban Indian now [laughs]. But I still hunt and trap, whenever I can. And I use the land as much as I could every time I have a chance I go out....*

*Jennifer: And what do you like about being out on the land?*

*Darwin: Doing stuff like my dad taught me, like skinning beavers, rats, you know, hunting. It's part of my life. And, I enjoy stuff like that... keep my culture going, you know.*

Diane Giroux (pers. comm., 2010), the Akaitcho Aquatic Monitoring Program (AAMP)<sup>10</sup> Coordinator, at several points in her interview, discussed the relationship between identity and culture, and how identity for many people in the community is tied to the land, water, and the places where people came from:

*Definitely because our people are land users and you know, our identity, our culture, traditions, are all tied to our land. I know like for me for example, my family's from Rocher River. They've travelled east of there, they've travelled north. They've been into the barren lands as well as utilizing this area...for example, in Rocher River, it's rich in moose. There's a lot of wildlife in that area, so just for example, there our family grew up with having a lot of traditional foods you know.....*

*...and I guess, the other part of it is that it's just a connection, it's hard to describe, but it's part of your identity...*

*...yeah on a cultural level, you know, it provides that identity, that I'm a person from that place, that area, and yeah it forms you. You know its rich in history...*

Paul Boucher Jr., one of the youth who took part in the photography project (see Chapter Three), described connections to his heritage and culture, using the metaphor of 'routes' (pers. comm., 2011). He described taking routes that his ancestors had taken, accompanying this description with a photo of skidoo tracks on a frozen waterway. Heritage (or 'roots') is something apparently very important to Paul, and from his photo essay, it appears that when he is on the land, he feels connected to his heritage and to his culture. In an excerpt from his photo essay (see Appendix II for the full essay), Paul (pers. comm., 2011) describes:

*The land and water is very important to me. I use the land quite often. The land is very special to me. It's where the people came from. As I was growing up, people always told me to respect the land. Treat it with pride.*

*I love going out onto the land. I learn something new every time I go out on the land, either its traditional routes or survival skills. I've been out in the bush in all four seasons and every season is a different experience.*

---

<sup>10</sup> At the time of interview Diane Giroux was the Aboriginal Aquatic Resources and Oceans Management (AAROM) program coordinator with Akaitcho.



**Figure 5: Snowmobile Tracks on the Frozen Water, Photo by Paul Boucher Jr. (2011)**



Youth Myranda Calumet<sup>11</sup> (pers. comm., 2011), also wrote about heritage connections:

*The water and land are important to me, because I could go hunting and learn my traditional ways on the land. This is part of my life because of my parents/grandparents went hunting and lived off of the land. I wouldn't mind on taking the tradition from my parents and then when I learn everything I could and then I could past [sic] it on to my kids when I have kids.*

Connections to a familial past, and the places where people were raised or spent time appear to influence relationships and connections with land and water. Within the coding for this theme, 16 people explicitly identified immediate family members as part of their connection to heritage and place. For example, land user<sup>12</sup> Warren Delorme (pers. comm., 2011) described how being taught by two important family members has shaped him, and how his family continues to connect with the land to this day:

*I was taught by two important people in my life, my grandfather and my dad. And now my children, my two boys and hopefully they'll carry that on. It is very important. I mean a guy don't get rich off doing it, but it makes a good living. I*

---

<sup>11</sup> As the objective of the participatory photo project was to allow youth to express themselves and explore themes of identity, water and change, in ways that were most suitable to them, some students – like Myranda – chose to focus on writing as opposed to submitting photos with their work.

<sup>12</sup> 'Land user' is a colloquial NWT term for people who go out on the land to trap, hunt, fish, harvest, etc., on a fairly regular basis. Typically land users are engaged in subsistence or commercial land-based activities which provide for them and others in some way. Land user is contrasted with someone who may use the land more recreationally. Some prefer the term 'trapper' to land user, and this was used in cases where people indicated a preference in this way.

*enjoy living off the land. And so does my boys, my daughter, my wife, even my little dog [laughs].*

Elder Mae Sayine (pers. comm., 2011), who spends a lot of time on the water and land, described spending time in the bush with her father, and how, because of those formative experiences, she still loves the bush:

*Yeah. Since I was seven years old with my dad. Winter or summer, doesn't matter I go out with him... with a dog team. And we don't have a tent or anything, my dad will just open the snow and put his spruce bough and put a blanket....that's why I'm the only one from my family that I like being in [the] bush.*

Tom Unka, who is an older community member and long-serving environmental resource staff person<sup>13</sup> (pers. comm., 2010) described these feelings of connections to the land in terms of 'places of origin', and how it has shaped part of his identity:

*Well, there is of course, there's always a dependence, there's parts of you that are out there, you know? No matter how educated you are, there's always part of you that always wants to go back to your place of origin, you might even say. Like I grew up in Little Buffalo River, I was born at Little Buffalo River, and I always want to go back there, even to sit there for an hour at the river.*

Being raised on the land and links to culture contribute to a sense of identity for older, long-term trapper and land user Arthur Beck (pers. comm., 2011), who also described his stewardship ethic which stems from his heritage:

*I was born and raised on the land, and I'm a part of the land. I feel like I'm part of the land. And I do my best to protect the animals and the water and the fish and the plants because nobody speaks for them. And I use that all my life, and I know almost everything about all the animals out there... [the way] I grew up, tradition was passed down to me through my grandparents because of my native languages. I understand. And so I carry a Traditional Knowledge that goes back five, six thousand years.*

---

<sup>13</sup> At the time of this dissertation, with Fort Resolution Metis Council

The idea of the land being ‘home’, in relation to heritage, was raised in a focus group (Focus Group Participants, pers. comm., 2011), as well as by at least three other participants. This had foundations in both past experiences (both cultural and familial), as described above, and via contemporary experiences. For example, one participant (community member Richard Simon) identified places out on the land as homeland for many people in the community. Others also described the feeling and connection to home in the following exchange:

*Trudy: We feel, well because there’s probably most of us that are here in this room grew up on the land....*

*Lena: You always want to go back...*

*Mae: Like for me I was raised in Rocher River, but I don’t live there in springtime.....by the time I get on the big river, I’m ever happy to go to my home. And I can live there, [not] short of food and that. And it’s a nice.....I don’t know why, I just feel like I’m, it’s so good to go home....*

*Trudy: It’s good to go home to where you grew up. It’s a feeling you can’t explain....Because the majority of the people in Fort Res[olution] grew up on the land, whether [it] be Rocher River, Jean River, Buffalo River, it’s where everybody lived.*

Community member Leandre Beaulieu (pers. comm., 2011) also described this feeling of home, and how he is always connected to place where he grew up:

*I grew up right by the lakeshore, go down to the water, see the water. When after I got older I moved away like go to a different community, you miss that, [the] sounds, that sight of the water, that feeling.... You do. And then when you’re travelling, [when] you’re coming back, you could sense it right away, you could feel it when you’re coming...*

While many people focused on heritage in terms of the past, seven participants also discussed the future and to the link between heritage and future generations. Some described the importance of protecting the land and water for future generations – including their children and grandchildren. Many people discussed their hope that future generations have the same

experiences that they had during their lifetime –and that if land and water continued to change, this may not be possible (see also Chapter Five). Additionally, as some participants identified, many of the teachings and experiences that defined their lives and how they grew up are not as feasible as they once were. For example, as land user and community member Darwin Unka (pers. comm., 2011) explained:

*Everything lives on water, you know....that's like my grandmother told me. You know my grandmother's right....carry on whatever she taught me. A lot of our elders are gone now, and whatever they left us, was lots - then. But now, it's going, slipping out of our hands now. You know? Kids nowadays, don't even know how to weave a basket, like birch baskets... you know sap from the tree, they don't know how to do that. They don't know how to make sap. I know how to do that, I could do that....us we were taught that by our moms and grandmothers.*

As seen in the passage above, the land and responsibility to care for it, is passed down from generation to generation; now young people are losing these activities and their language. From the interviews, there is an identified sense of loss, in that some of the teachings and the Elders who held those teachings have been lost (see Chapter Six). Furthermore, fewer young people are gaining experience on the land, partly because of this loss and partly because of other increasing influences (e.g., television, Internet, etc.).

#### ***4.2.1 Place Identity Constructs Associated with Heritage and Connections to the Past***

Several place identity constructs (see Chapter Two), emerged through the analysis of the theme ‘heritage and connections to the past’. People are defined by the experiences they had on the land with family, and many are connected to the land through their culture which shapes how identity is enacted or experienced. I will focus here on a few key constructs that emerged with the most frequency in participant responses: social connections (18 responses), rootedness (11

responses) and sense of belonging (five responses). Responses related to security (n = 1), continuity (n = 3) and commitment to place (n = 1) also emerged, but with lower frequency.

As evident above, social connections via experiences with family members, were important for heritage connections to place. 18 people described the importance of relationships with family members in places, whether from the past or through engaging in traditional activities in the present. For example, in the quotation earlier from Elder Mae Sayine (pers. comm., 2011), she described her experience with her father as the reason she is the only one of her family who likes the bush today. These early experiences created a feeling of belonging in the bush that were mediated by her experiences with her father while engaged in traditional activities. Active land user Arthur Beck (pers. comm., 2011; see earlier quotation) described feeling part of the land, stemming from being raised on the land and the Traditional Knowledge that has been passed down to him. These social connections, via connections to heritage are important for adaptive capacity (see Chapter Seven), and strengthening social connections through land-based activities could serve to increase adaptive capacity (Chapter Seven; see also Wesche, 2009).

Rootedness emerged as the second strongest place identity construct related to heritage. Rootedness was also discussed in the focus group. For responses that were coded to the rootedness construct, the majority of these were tied to family and cultural connections (heritage) to place, and often associated with long-term use and deep attachments. This can be seen in the quotations above from Tom Unka (pers. comm., 2010), Diane Giroux (pers. comm., 2010), Arthur Beck (pers. comm., 2011), Mae Sayine (pers. comm., 2011) and Warren Delorme (pers. comm., 2011). All referenced their continual use of the land as influenced by early experiences with family members in 'home' places. In the passage above from the focus group (Focus Group

Participants, pers. comm., 2011), several participants described that it was always good to go home to the place where you grew up, and that there is a pull back to that place – or ‘*a feeling you can’t explain*’.

Intimately linked with rootedness and social connections is ‘sense of belonging,’ which was also prevalent within discussions of heritage. Going back to ‘your place of origin,’ as described in the quotation from older environmental resource staff member Tom Unka (pers. comm., 2010), reflects both a rootedness associated with the place you come from and a deep sense of belonging to that place, in that there’s “*part of you that always wants to go back*”.

Loss of place, through impacts to water (as described in Chapter Five), may result in disconnections from heritage, and lead to experiences of loss of culture, sense of belonging and rootedness. This can lead to experiences of anger, frustration and helplessness, and will be further discussed in Chapter Six. Impacts to heritage connections, through impacts to specific place identity constructs may have important implications for adaptive capacity (see Chapter Seven).

### **4.3 Health and Wellbeing**

Of the participants, 28 people discussed relationships between place and health and wellbeing of community members in their interviews, as did participants in the focus group. The influence of relationships on health and wellbeing ranged from physical health benefits of engaging in activities on the land or from consuming water and/or country foods, to emotional wellbeing derived from gaining peace and perspective and to engaging in culturally fulfilling activities.

Being out on the land and water, or traveling to special places, were described as opportunities for individuals to feel like their best self, feel safe and comfortable and to gain peace and perspective, which appeared to contribute to place connections for 16 respondents. This can be seen as potentially linked to the ideas of self-esteem and self-efficacy that are key attributes of place identity (see Chapter Two). For example, an active female land user (Anonymous, pers. comm., 2011b) described being more comfortable out on the land than in town:

*I don't have to depend on anybody... [sort of laughs]. But I like it. I feel more comfortable out there than I do in town here. Because it's quiet, like you could listen to the animals and, hmm mm. It's nice.*

During his interview, land user Kenneth Delorme (pers. comm., 2011) explained that he loved going out to Little Buffalo River, and other places on the land. He spent a lot of time out on the land, and liked everything about being out there. For him, he felt happier, and that being on the land 'feels good', and that though hard to describe, the feeling was 'priceless'. Elder and community-member Herbie Beaulieu (pers. comm., 2011) echoed this, when asked if he would prefer the opportunity to be out on the land or in the community:

*I'm more at peace, more...you felt more alive you know...no favourite places, I'm happy anywhere I go out on the land.*

For one Elder (Anonymous, pers. comm., 2011c), the bush represented a place where there were things for people to do, in contrast to in the community where jobs are not easy to come by. As such, being in the bush was a chance for escaping some of the social challenges prevalent in the community. As he explained,

*I feel good. Always got something to do when you're in the bush. [In] Res<sup>14</sup> here there's nothing to do here but walk around. No jobs.*

---

<sup>14</sup> 'Res' is short for Fort Resolution, and is often used colloquially when referring to the community.

Nine participants described time on the water, in the bush or in special places as an opportunity to escape stress and anxiety or worries of day to day life. These opportunities for peace and quiet, and for ‘perspective’ can contribute to overall wellbeing and maintaining emotional and mental health. For some, the land was the only place where these things were possible. As one male community member (Anonymous, pers. comm., 2011a) described:

*Yeah their minds. Their minds are a lot healthier. They think, they don't think of nothing back home. If they go for the weekend, they think of Monday, they'll come back to work or whatever. But once they're out there, they're whoo<sup>15</sup>, they just think of fishing, hunting and enjoying the weather and the water and just being out on the land is a good life for anyone.*

For some people, opportunities to go out on the land meant escaping negativity within the community. Female community member Trudy King (pers. comm., 2011) described this:

*I feel more relaxed I think when I'm out there. Because you don't have the pressures of living in a small community.*

Community-member Velma Delorme (pers. comm., 2011) described being able to breathe when out on the land:

*Yeah, like you know even when I go to Buffalo River or Mission Island, I could tell you I just feel so, like I can breathe in and breathe out. There's no anxiety there. Like you know?*

Community member Raymond Giroux (pers. comm., 2011) described a similar experience:

*Yeah. Seems like when I'm in town, like... before you work on the water truck, I used, to, sometimes I don't work on weekends, I always go, I have a trap line out and boy, if I go in the bush for a couple days, boy my mind feels a lot better when I come back to town eh? For me it's like that.*

---

<sup>15</sup> ‘Whoo’ was used to replicate the sound of something taking of, or something being gone.



Older community member Raymond Simon (pers. comm., 2011) felt similarly about the land, and how people could gain better thinking through connecting to land-based activities. He also described how people did not always use the land for what he felt were the right reasons, but that was beginning to change:

*When they go out on the land? Totally different, it's totally different, they're out there and they're starting to think things, and they're starting to hunt, and fish, you know. Although a few years back there was so much people going out there and not so much, but I mean a few people going out there, and they were you know, they're all out there and doing things they shouldn't be doing out there. And I think that's sort of fading away now, because the other people are coming up and there, they want to hunt and they want to fish and they want to look around over there, so it's getting a lot better. And it's like I said, people are beginning to use it for the right reasons now.*

Male community member Lloyd Norn (pers. comm., 2011) described the land as therapeutic, and that stress could just disappear from spending time on the land:

*And there's something about it you know, you go out, even for one day, all the stress from, just leaves you. You feel peaceful. Yeah it's therapeutic. Even if you're sleeping beside even the water, you eat better, you sleep better, and you're busy right from when you wake up in the morning 'til you go to bed at night. Which leads to a much happier lifestyle.*

Providing opportunities for people to connect to the healing attributes of the land and water may prove to be important for adaptive capacity and community-building, and will be discussed further in Chapter Seven.

In the focus group (Focus Group Participants, pers. comm., 2011), everyone agreed that being out on the land was healthier for a wide variety of reasons. One participant brought up the idea that when you are in the bush, it is the best night's sleep one can have. This was linked to a decrease in stress that people experienced when they were out in the bush. The majority of the other group participants agreed with this.

Being out on the water and land can also provide physical health benefits, whether through physical activity, work, or through the consumption of healthy foods and medicines that come from the water and land. The physical benefits of land and water were described by 12 participants. For example, as Elder and trapper Lawrence Fabien (pers. comm., 2011) noted, “*It’s a healthier environment. And for free I guess*”. Many of the following comments from research participants are linked to ‘what the land provides’. However, in the case of this discussion, these comments were linked specifically to the notion of health.

Community member Lloyd Norn (pers. comm., 2011) described how in the past a person was busy all day, which helped with feeling healthy physically and emotionally. In his statement below, he also connects hard work to other aspects of health and wellbeing discussed in this section, including happiness and peace and perspective:

*I don’t remember too many people getting sick, because we lived a much healthier lifestyle then. No TV, no computers, and we all had lots of chores. Things like had to haul wood, haul water, saw the wood by hand, split it, bring it in, make fire in the morning, just about every kid had a snare line. Yeah we all set hooks... we were pretty healthy when we were young, maybe not so much now.*

Active land user Rocky Lafferty (pers. comm., 2011) described something very similar:

*Yeah, it feels really good, it’s, you feel a lot more energetic, there’s always something to do out there ... it’s just natural, it’s natural way of life for me I guess.*

Elder Solomon King (pers. comm., 2011) described feeling better on the land because there was always something that had to be done, which in effect could keep a person feeling younger than their years:

*Well, here you get old fast eh? Out there, you wouldn’t get old, you’re busy all the time, move, move.....sitting here get old fast, don’t do nothing. Get weak eh? [laughs].*

Access to and consumption of country foods also contribute to physical health and wellbeing for community members. Elder Alice Mandeville (pers., comm., 2010) stated that growing up on the land '*we used to have all kinds of wild stuff, those days*'. Community member Violet Mandeville (pers. comm., 2011) described how when she grew up on the land, her family had their own garden, would make and eat dry meat and muskrat tails as a snack, and only had healthy foods all of the time. She also recalled never seeing someone who was overweight, nor did there seem to be as many diseases such as cancer. Changes to the water and the land (see Chapter Five) are seen as potentially having an impact on how healthy and available country food is. For example, Elder Solomon King (pers. comm., 2011) explained that he would not eat fish from the Slave River now, as they are 'no good', but felt that fish on Taltson were okay. One Elder trapper (Anonymous, pers. comm., 2010a) described catching muskrats with 'pus and stuff on them from the water'.

However, not all people feel that country foods should be avoided yet. One Elder community member (Anonymous, pers. comm., 2011d), who does not spend much time on the land, stated: '*I eat fish once in a while, when I get it. But nobody told me anything about the fish yet, so. The ducks, fish, are all good yet.*' This was raised by a few other participants as well, though not very commonly.

Country foods are often considered to be safer and healthier than store bought alternatives, which are increasingly utilized by people in the community. Many participants in the focus group addressed access to good healthy foods, indicating that on the land the food is not processed like it is at the store (Focus Group Participants, pers. comm., 2011). Additionally, as Henry McKay (pers. comm., 2010) stated:

*The way things are going even, our store bought food I heard is not that great. 'Cause they did a study one time about us people living off the land, and people*

*store bought. They say us we're more healthier than people with store bought food. They put stuff in that. And not only that I heard that stuff they put in there, that's why our kids are so big eh? You notice that, so many kids are so big. It's the food eh from the store?*

The ability to consume country foods and traditional medicines can also be a fundamental part of wellbeing and overall health – not just physical health. Though not discussed at length in the interviews, based on analysis of the other constructs and themes identified in this chapter, it is likely that country food consumption – as part of connection with the land and water – can be identified as part of engaging with culture and heritage. When access to country food changes (regardless of the cause), this can have impacts in maintaining connections with place and subsequently place identity. This will be further explored in Chapter Six.

As discussed in Chapter Five, water used to be considered healthy and safe to drink by community members. However, many people are now distrustful and concerned about the safety of the water in the community and out on the land. Furthermore, many are concerned about the safety and viability of many of their country foods. As a community that has intimate relationships with the environment (including water, land and all interconnected parts of the system), as demonstrated throughout this chapter, these community-identified impacts to water can be incredibly detrimental to maintaining place-based identity and can impact emotional and physical health and wellbeing. Such impacts, and the relationship of loss of drinking water for community members to identity will also be discussed further in Chapter Six.

This relationship between water and health is not surprising, given the role that water plays culturally for Dene, Métis and Northern people. In many descriptions of the importance of water, health or body metaphors are invoked (see for example the DKFN quote in Chapter Three,

in which the health of the water is clearly linked with the idea of health for people, and for the ecosystem as a whole).

#### ***4.3.1 Place Identity Constructs Associated with Health and Wellbeing***

As identified above, the role of the water and land in health and wellbeing informs and shapes several aspects of place identity, and as such is critical for maintaining strong place identity and good health (emotional, spiritual and physical) (see Chapter Seven). In relation to health and wellbeing, place identity constructs self-efficacy and self-esteem emerged most strongly, with 18 and 13 responses respectively. Self-esteem was also identified in discussions from the focus group. Self-esteem and self-efficacy are intricately connected, and during the coding process, many of the same passages were coded to both as they related to both constructs. As such they are treated holistically in this section.

As described in the previous section, feeling like one's best self was an important part of people's connections to water and land. People also described feeling happier and healthy when out on the land, and achieving peace and perspective. For example, community member Leandre Beaulieu (pers. comm., 2011) described feeling more alive, and sleeping and eating better (see also earlier quotation from community member Lloyd Norn, pers. comm., 2011). These experiences contribute to strong self-esteem as related to being out on the land. Land user Kenneth Delorme (pers. comm., 2011) also felt happier on the land. This is echoed in statements above from Mae Sayine (pers. comm., 2011). People also described these experiences in relation to being in the community – in that being in the community could not offer comfort, peace and other feelings that contribute to self-esteem and self-efficacy in the same way the land does (see

for example, earlier quotations from Trudy King [pers. comm., 2011] and an anonymous male community member [pers. comm., 2011a]).

One female land user (Anonymous, pers. comm., 2011b) described not having to depend on anyone else when out on the water or in the bush. This demonstrates feelings of self-efficacy, in that on the land she feels that she can do what she needs to accomplish without aid from other people. Solomon King (pers. comm., 2011) described feeling healthy and younger out on the land, and Mae Sayine (pers. comm., 2011) described feeling physically more capable when out at her cabin. For both, this demonstrates that they feel they can accomplish certain tasks when out in the bush, that may be more difficult when in the community.

If places change (as described in Chapter Five) beyond the bounds of what is considered ‘acceptable’ to an individual and no longer meet the needs of the individual using them, they may no longer support self-esteem and self-efficacy (see Chapter Six). This can potentially impact adaptive capacity and the undertaking of adaptive strategies for dealing with watershed change (see Chapter Seven).

#### **4.4 What Water and the Land Provide**

During interviews, 36 participants described interconnected experiential and functional attributes of water and land that they value. Experiential attributes of place represent the feelings and experiences of the land that people love and identify with, and functional attributes of the land reflect specific tangible aspects of land and water that can be used by participants (e.g., harvesting of plants and country foods).

Being on the land was defined by the experience of being in nature, and having enjoyment and fulfillment come from the land. These, to a certain extent, are overlapping but

separate from the ideas put forth in the health and wellbeing section. In the health and wellbeing section, the themes put forward were linked specifically to experiences of health and wellbeing, whereas in this section, the themes discussed are more abstract, and simply about enjoying being on the land.

The land can provide people with a freedom not experienced anywhere else, and seven participants explicitly identified freedom as an important aspect of why being out on the water or land was important to them. This could be freedom from any number of things, including pressures of work, life, personal relationships, and community or personal challenges (as addressed in Section 4.3). Some just felt that they could do what they want on the land – that they had the freedom to just be. For example, Elder land user and community member Ernest Beaulieu (pers. comm., 2011) described this sense of freedom, and it how feels for him:

*It's the life itself, free, didn't have nobody watching your back and telling you hey don't do this and...the freedom. And when I come to town, just always somebody yelling hey don't do this, don't do that...*

*...but when I was out on the land, I don't do this, you just did the best work you can, you survive it, or else you don't...*

Community member Ronald McKay (pers. comm., 2011) also described this sense of freedom, when asked about what he likes about being out on the land:

*Everything. I mean it was freedom, we were allowed to do things, you were taught to do things. And most of all, I guess, is being able to see my parents and everyone else survive out there without difficulty. And being one with the land I guess.*

Community member Wilfred Beaulieu (pers. comm., 2011) also described feeling free out on the land, in the following exchange from his interview:

*Jennifer: What do you enjoy about being out on the land?*

*Wilfred: Freedom. That's about it.*

*Jennifer: You just feel more free when you're out there than say here in town?*

*Wilfred: Oh yeah, for sure, yeah. Nobody asks you any questions, nobody asks and nobody questions, out there just for yourself, and quiet time and back to culture too you know. Back to your roots, good to be, untouched.*

Many people simply described enjoying being on the water and land, for no other reason than the experience of being in nature and being out in the bush. The land is peaceful, quiet and beautiful (Focus Group Participants, pers. comm., 2011). Land user Kenneth Delorme (pers. comm., 2011) described the feeling of being out on the land as priceless and ‘just our way of life.’ Community member Violet Mandeville (pers. comm., 2011) indicated that you don’t need cable or TV when the land is so peaceful and beautiful. Land user Ron Beaulieu (pers. comm., 2011) indicated it was the ‘*quiet. No TV, no phone*’ that made him feel happier out on the land.

Youth participant Shania Miersch (pers. comm., 2011) described her experience of water and the land in her essay, which was accompanied by a beautiful photo from within the community (see Appendix II for full essay):

*The water and land are very important to me because where I live, every time I turn my head that’s exactly what I see. Land and water, I enjoy spending my time looking at the beautiful things like those. Everything I do revolves around the land or water. The changes affect me because I do go fishing in the lake, which has been dropping since last year.*

**Figure 6: Photo by Shania Miersch (2011)**





Older community member Raymond Simon (pers. comm., 2011) described the experience of being out on the water, which was coupled with a feeling of freedom:

*Okay, out on the water? Just it's so, like, being out on the land or on the water it's just that you're so, there's nothing around, there's no radios or dryers or trucks or anything, You're just so, you're so free out there you know. It's just so calm and quiet, you could hear all the, you know, if you shut everything off, you just hear the animals and birds and stuff, it's just so beautiful out there, and I just love being over there, even the smell of the air is... [laughs]. Not cheap but, being out there, I'll tell you that.*

Female community-member Violet Mandeville (pers. comm., 2011) described her desire to build a cabin and live out where it is quieter, easier and she can hear the birds singing, and that when people are close to the land they are close to the Creator. This is also evidenced in the exchange below between community member Raymond Giroux (pers. comm., 2011) and community researcher Catherine Boucher. To understand variations in connections to the community as a place, to water as 'place' or to specific places out in the 'bush', participants were asked where they would rather spend time if they had the choice, or if they felt better or happier on the land versus in town. This helped to distinguish different types of place bonds, as well as implicitly examine other factors (which may operate at multiple scales) in influencing how people made choices about use of place. For example, as community member Raymond Giroux explained:

*Catherine: Where would you rather be? You rather stay here, or you rather stay in Rocher River if you had the chance?*

*Raymond: If I had a chance, I'd rather stay in Rocher River. At least I'm not working, but I could be out trapping on the land there eh? Me I was going to go back trapping too, but I'm just going to wait 'til this fall, then go back... this fall to the bush. That's the plan.*

Land user and community member Darwin Unka (pers. comm., 2011) expressed similar sentiments, when asked about where he would be if he had the choice:

*Darwin: Yeah if I had the chance I would, I'd be back in the bush absolutely....go back to my roots there...I'd love to go back in the bush.*

Land user Ron Beaulieu (pers. comm., 2011) also described how being in the bush was always a part of his life, and being out on the land seems natural now, and his responses to being asked about where he would prefer to be:

*I spend a lot of time away from home and it doesn't bother me. 'Cause when I was younger, I spent a lot of time on the land with my dad, like, I really I had no choice, I had to go, it was part of survival since he was a trapper and he had to make out for the family through trapping. So I used to be gone like two, three weeks at a time. And as you're a teenager you want to spend more time you know in town, dances what not, but I had to be out there. So now as I got older, even [if] I'm gone from home six weeks, a month, doesn't really bother me.*

Elder and trapper Lawrence Fabien (pers. comm., 2011) explained how being on the land was always what he wanted to do, and how he balanced that with working:

*I'm not really sure I guess, it was just something I always done and wanted to do. It's ways of making a living I guess. And one of the, I just wanted to be out there. Every chance I had I went out there, but I was working, but I spent all, every, every time I could go out there on the land eh? I still do today. Hunt and trap so.*

Seven participants described feeling lonely for the places they had grown up, or bush life in general. One male land user (Anonymous, pers. comm., 2011e) described being out on the land (particularly Taltson River area) as what he values most, and that he gets lonesome for the land when he is in town, as it is home for him. Elder Solomon King (pers. comm., 2011) described this with reference to his home at Rocher River<sup>16</sup>.

---

<sup>16</sup> Rocher River was a settlement located on Taltson River, east of the Slave Delta (Freeman, 2008). The area was part of the traditional territory of the Tatsanottine Dene (Freeman, 2008). According to Freeman (2008, p. 1), "Today, the Tatsanottine Dene commonly refer to themselves as "Rocher River people" and over the past twenty or more years some have called for a renewal of their cultural identity in an effort to be seen as distinct from their cousins the Chipewyan." A number of families in Fort Resolution came from Rocher River, precipitated by the burning of the school there (1958) and the closing of the Hudson Bay trading post (1963), in addition to other factors (Wesche, 2009). The settlement on Taltson River is now abandoned, but many people still identify strongly with

*Catherine: [translating from Chipewyan] He gets lonesome, that's why he goes back to Rocher River.*

*Solomon: It's my home town. Nobody around but still I go there.*

Finally, it is important to note that not all community members feel this connection with the land, nor do they miss being out there. This only came up in one interview for this research study, but may be shared by other community members not interviewed. This may have implications for adaptive capacity (see Chapter Seven). As Elder Fred King (pers. comm., 2011) described:

*I [went in] the bush when I lived with my parents. But up to that, no bush for this man here. It was not my life. I don't like bush at all. Sure I go in the bush just for a ride, not for [a long time].*

Elder Leonard Beaulieu (pers. comm., 2011) described something similar, by stating that:

*There's not much people left now, that enjoy living off the land. Eh? All young generation now...*

Functional attributes of place are related to tangible things that the land provides for people, and those things that they gain from land that shape that relationship with it. This can include things like access to places for hunting and trapping, clean water, country foods and the scenery itself (which contributes to the above experiential attributes). These functional attributes also link to the idea of social connections as many of the things discussed in this section provide the foundation for creating the space for social experiences (please see section 4.5 for more detail).

---

Rocher River as part of their identity and in terms of 'home' (Wesche, 2009). For more information on the history of Rocher River, please see Freeman (2008).

Community member Raymond Giroux (pers. comm., 2011) described his hometown of Rocher River, and how it was one of the best places for country food, making it a good place to be:

*Rocher River's good too...in the river, boy there a lot of fish there. Year round, every time of the year you set a net, all winter it's lot of whitefish, jackfish, pickerels, a lot of fish. Sometimes you [get to] catch a trout there. It's a good place there too, because springtime too, there's a lot of geese there too eh?*

Female community member Velma Delorme (pers. comm., 2011) also talked about the importance of country foods and how they shaped her experience of Little Buffalo River:

*It was so much fun. Then we used to eat mostly fish, rabbits, you know [and] in springtime ducks and geese. Now I wouldn't eat ducks and geese. No. I would eat fish if it's healthy enough to eat. I know, we know our fish, you know me and my husband, we know from our parents and our grandparents, showed us all you know, how, what to eat and what not to eat. So we know all our traditional foods, that we can you know survive on?*

One Elder community woman (Anonymous, pers. comm., 2011f) also described the value of country foods and how it shaped her experience growing up:

*Yeah it was nice in the bush, bush life. Especially early in the morning and in the evening. Those are both my favourite time. And we [her and her grandfather] used to go for rabbit snares, we had an island, a little island on the other side of there, little river there, we used to go out in a little boat, we had snares on the other side.*

Five participants described enjoying the sounds of the birds, both in and around the community and while in the bush. Nowadays, bird songs seem to be less common than before.

As Elder Mary Pierrot (pers. comm., 2011) described, with a certain sadness:

*Now we're losing even lots of birds... water's no good. Remember in the spring time? We hear frogs all the time, now we don't hear that anymore. And like lots of birds that we used to see, used to be lots of bird. Remember the kids that used to go hunting birds? Now we don't see those birds....we notice that, old people.*

Youth participant Paul Boucher Jr. (pers. comm., 2011) also described what the land gives him in his essay, as evidenced in his quotation included in section 4.2.

As evidenced above, many people are connected to the land because of what it provides, whether experiences or tangible, functional things like country foods, and in a myriad of ways. These attributes (whether experiential or functional) contribute to many of the other connections with place and water described throughout the chapter, often providing the foundation upon which those other relationships are built. Water is a unifying aspect of these functional and experiential attributes. As one female land user (Anonymous, pers. comm., 2011b) noted, when asked if water was something important to her:

*Yeah, because we live off of the water, we get our fish from there, and that's our way of getting out. Get our fish and then that's the way we go out to go hunting. So it is a big important part of our life.*

#### ***4.4.1 Place Identity Constructs Associated with What the Water and Land Provide***

With respect to the theme 'what the water and the land provide,' the place identity construct rootedness emerged most strongly, with 10 responses. The second most prevalent construct was self-efficacy. Additional constructs (e.g., sense of belonging, self-esteem, security and distinctiveness) also emerged, but with less emphasis.

Community members described the experiences in places that made these places special, such as the experience of freedom when out on the land. For example, Raymond Simon (pers. comm., 2011), Wilfred Beaulieu (pers. comm., 2011), and Ronald McKay (pers. comm., 2011), and Elder land user and community member Ernest Beaulieu (pers. comm., 2011) all described feelings of freedom on the land, and how important this was to each of them. Other community members, such as Solomon King (pers. comm., 2011) and one male land user (Anonymous, pers.

comm., 2011e), described being lonesome for the places they grew up in or loved. Raymond Giroux (pers. comm., 2011) indicated he would rather stay in Rocher River, his home town, than in Fort Resolution. This sentiment was also expressed by Darwin Unka (pers. comm., 2011). These experiences and attachments can extend from heritage and cultural land uses, or long, sustained use of a place. The experiential feelings afforded by these places further reinforced the deep connections people establish with those places.

Though feelings of rootedness did not emerge explicitly in relation to functional attributes of water and land, based on the quotes above, it appears that these attributes can provide the opportunity for activities that can create or reinforce experiences of rootedness. For example, having the opportunity to hunt, trap, fish and access country foods in places that are important to people (because of long-standing connections), further reinforces how connected people are to those places. This can strengthen deep attachments to place(s).

Five participants provided responses that displayed feelings of self-efficacy in relation to what the water and the land provide. This was most notable with respect to discussions of feeling free and able to do what you want when out on the land, as described above.

With community-identified water changes (Chapter Five), there is the potential to lose access to places, resulting in loss of certain experiences that these places provide. This can potentially impact rootedness, especially when rootedness is strongly connected with specific experiences or attributes of place. This will be further discussed in Chapters Six and Seven.

## 4.5 Social Connections

12 participants expressed that time on the land and water created opportunities for connecting with family and friends – in other words, opportunities for social interaction. This was also discussed in the focus group. Social connections were also identified as important for heritage values earlier in the Chapter. The land – and specific cultural/traditional sites on the land – was a place for social gatherings in the past, and where people who travelled nomadically were able to come together and share stories, updates and interact with each other. Sharing of information and story-telling, cultural traditions and experiences were passed down and social networks between individuals and groups were strengthened. Waterways provided the link for this communication to take place, as described in this exchange from a focus group (Focus Group Participants, pers. comm., 2011):

*Lena: Well people go out and they live on the land, and then sometimes, well in the past it was like that eh, they used the waterways to travel, communicate with each other.*

*Richard: Yeah bringing news between communities, even now when you're out....sharing...*

*Jennifer: Okay, so being able to connect to other people through water is very important?*

*[people are in agreement]*

*Richard: Still...and the communication [was] more personal...Elders, close friends, extended family, and you had a chance to communicate that information....*

Elder land user Lawrence Fabien (pers. comm., 2011) offered a similar experience:

*Like I was saying...in those days things were easy, and my mother was telling me the same thing...we used to leave Hay River, in the spring, and the time never meant anything to them. 'Cause they didn't have a schedule they had to meet. So if they left Hay River and they went half ways up the Big Buffalo and they shot a moose, that's where they stayed 'til the meat was dry, 'cause they didn't have to go to the store for groceries that was their store. And then they worked all the way up to Big Buffalo [River] 'cause there's no time limit where they had to be at a certain place. And then they eventually made their way up to the lake, and then*

*they'll do the same thing coming back. And one of the reasons why I guess, a gathering at treaty times [my mother] told me, was [a] place where people would meet and see how the rest of the people were doing, storytelling was a big part of that eh? You know, the latest news or whatever [laughs], a bit late but it's still shared a lot of stories, where people were and what they were doing. That's what I got from my mother, so.*

People would gather with each other when they were out on the land, to socialize and to engage in religious activities. Angus Beaulieu (Focus Group Participants, pers. comm., 2011) describes this coming together of some people on Sundays to have prayers, after which they would have tea and listen to Elders' stories:

*When you're out, when we're out on the land, when somebody comes along, everybody goes to a certain house and they have a prayer, say a whole rosary, and have a cup of tea after. That's what we used to do. Not all [people], Rocher River.....there's no priests there, [but] there's always old man [name] there, and he used to have prayers there[sometimes would rotate] ...a small place in the bush where we had, where I was growing up, my grandfather's brother had a cabin there, that's where we used to have prayers.*

In the past, people also shared the things the land provided for them – things like food, water and traditional medicine. Elder Fred King (pers. comm., 2011) described how the sharing of food took place in the past:

*Somebody killed moose or caribou or something, next door neighbours, he gave you meat, you do the same thing. You know, share, you know. People they get along, people, no fight, no drinking, that's why I guess no fights. No drinking, nobody drink. And everybody get along, they get respect from elders.*

Food sharing has changed quite a bit in today's society. People are less forthcoming than they once were. This sharing of food, and changes to the practice, was also described by members of a focus group (Focus Group Participants, pers. comm., 2011):

*Trudy: And when they went hunting or they harvest their fish and that it was all shared amongst everybody.....*



*Richard: Yeah it seem...sharing... [sharing is gone]<sup>17</sup>*  
*Trudy: It's gone.*  
*Richard: It's really.... [helped people out]...*  
*Trudy: It's like pay it forward, help somebody*  
*Richard: They seem to get.....*  
*Angus: A young guy kills a first moose, a caribou, make sure to give a small shared piece with everybody.*  
*Richard: [not like it used to be]*  
*Mae: Them days they wouldn't pay for meat.*  
*Trudy: No you never had to go buy meat, you shared.*  
*Mae: No, yeah you just give.*  
*Jennifer: So it's not like that now?*  
*[everyone agrees no]*  
*Mae: If you're out of meat...*  
*Trudy: You're out of meat you gotta go buy from somewhere. Buy beef from the store.*

Community member Velma Delorme (pers. comm., 2011) talked about people coming together today, and how gatherings on the land lead to recalling stories and experiences from long ago:

*Listen to music and people come and we have so much fun talking about long time ago, and you know, there's lots of long time agos. A lot of long time ago stories that come up.*

While many participants reminisced about what it used to be like, a few also described how the land provides them social opportunities in contemporary times – and that this is what they love about spending time on the land. A few people felt that time on the land allowed them to connect with their friends and have fun in a place they loved. For example, Raymond Simon (pers. comm., 2011) described what he liked about going out on the land:

*Yeah, mainly like just fishing trips with friends and, not so much hunting, mainly just fishing trips, and like seeing around, looking around and showing your friends the beautiful East Arm you know. Mainly that's what it is.*

---

<sup>17</sup> It was hard to hear on the audio tape of the focus group for transcription purposes, so passages are filled in with information from community researcher notes and flip chart notes.

One female student (Anonymous, pers. comm., 2011g) who participated in the photo project, described what she enjoyed about going out on the land:

*I love going on the land because it is a great place to go with your friends to chill out. When I go out on the land with my friends we always go out on a boat.*

Morgan Unka (pers. comm., 2011), another young girl from the youth photo project, also described this:

*This is one of the most beautiful places I know. The landscape is phenomenal, I never been anywhere so quiet and peaceful. Being away from Fort Resolution and being out on the land with your best friends is fun, even if it's just for a boat ride or the weekend. Since I just started going in the bush a lot this summer my Father bought me two guns so I could shoot animals. It is a great experience learning the rivers and keeping our tradition strong.*

Catherine Boucher (pers. comm., 2011) described trying to motivate people to spend time out in the bush who do not typically get out a lot, to do things like pick berries or have picnics:

*We try to encourage them, c'mon lets go. You know try to encourage people, let's go for a picnic, or you know, let's get out, just to get out.*

Today, spending time on the land also creates opportunities to pass on traditional teachings or activities to younger generations. Youth Morgan (pers. comm., 2011) also wrote about learning about traditions in her photo essay, as included in the passage above. However, this is changing, and less youth are engaged in land-based activities, and many traditions and cultural teachings are being lost (though there are some programs to support this, which will be described in Chapter Seven). Learning to fish, hunt, make dry meat or set traps is something that is best taught out in the bush:

*Culture is where you go on the land, where you learn the traditional way of life. How to set traps, how to harvest your fur, you know, your meat, and everything, how to live on the land. That's culture. For the kids, and these kids are not learning like what they should be learning. I know that, but a few times they had*

*culture week at the school. And then they're buying geese and ducks and beavers around town. That's not culture, the way to you know, to show them how to live off the land. You show them all that you go let them get it, and you show them how it's done. They don't do that here. (Velma Delorme, pers. comm., 2011)*

While it has changed from the past, the land still provides opportunities to be with family, friends and loved ones and to connect to people in a wide variety of ways. This can range from engaging in traditional activities to just being with friends. For some folks in the community, going out for short trips with friends or family is the only time they get a chance to spend time on the land (Participant Observation, Author, 2010; 2011).

#### ***4.5.1 Place Identity Constructs Associated with Social Connections***

Six people, as well as focus group participants, identified the social connections experienced and enacted through place as important influences on person-place relationships and why the land and water is important to community members. 'Social connections' is also considered a specific place identity construct, therefore much of the experience of this construct has already been detailed in the section above. The relationships that people have with others is mediated through place, and these experiences serve to make those places important as part of identity. Having the opportunity to continually see places, and forge social relationships within them, can contribute to maintaining strong social ties and cohesion, important for adaptive capacity (see Chapter Seven). Loss of social spaces can potentially result in the weakening of social ties and relationships (Chapter Six). Rootedness was the second strongest construct, identified by three participants.

## 4.6 Identity/‘Our Water’

Throughout the above sections, the identity with land and water, or place-based connections to land and water are examined via constructs associated with place identity. This theme, which focused on explicit identity connections made by participants, emerged in twenty participant interviews. As such, the themes were drawn out and connected to place identity constructs based on established literature (see Chapter Two). In this section, specific instances of how people connected land and water to their identity are discussed, as are the links between knowledge of the land and place-based connections. As identified in Chapter Two, place identity is experienced and articulated in myriad ways, and different themes raised by research participants are examined.

Identity can be rooted in culture and heritage as described earlier in this Chapter (see section 4.2). It can stem from the places that people or their families are from, or it can come from a link to their ancestors and to culture that has been passed down through generations. Community member Violet Mandeville (pers. comm., 2011) described water as part of the spirit and of the body, and for her that it is part of her, her life and her ancestors. She also noted that without land and water, people would not be alive to today. This link to ancestors and culture can in part be defined by a people who were land users and whose culture was rooted in the land and water since time immemorial. Diane Giroux (pers. comm., 2010) elaborated on this, both with respect to overall culture and to familial connections, as evidenced in her passage cited earlier in this Chapter (see Section 4.2).

DKFN Environment Manager (at the time of interview) Patrick Simon (pers. comm., 2011) described the community’s identity as linked to the water they rely on:

*We're tied to it, we're delta people... sometimes people mistake us for just being only here in the delta, because we love the delta so much, we do a majority of our time spent here, but we, we're comfortable in the bush and out in the tundra as well, and we do that as well. But we're delta people, so we really relate to the delta more so.*

As noted in Chapter Two, place identity is not always easily articulated by people, and explicit detailing can often only emerge after a place has been threatened. As such, the importance of place relationships to who people see themselves was not always explicit, but was recognized as important nonetheless. The land and water is simply a part of them. As one female land user (Anonymous, pers. comm., 2011b) stated, *'I love it, it's quiet, it's me.'* Trapper and land user Arthur Beck described feeling like he was a part of the land, and it was part of him, stemming from a long and deep connection with using and growing up on the land:

*I was born and raised on the land, and I'm a part of the land. I feel like I'm part of the land. And I do my best to protect the animals and the water and the fish and the plants because nobody speaks for them. And I use that all my life, and I know almost everything about all the animals out there... [the way] I grew up, tradition was passed down to me through my grandparents because of my native languages. I understand.*

Identity with (or connections to) land and water can come through a strong knowledge of the land, similar in vein to the idea of environmental mastery or skills (see Chapter Two). One male land user (Anonymous, pers. comm., 2011e) described knowing all about good ice and bad ice from spending time on the land regularly and witnessing the changes from year to year and learning with the land. Because of this time on the land he can identify bad ice, and travel the trails in the dark. This mastery comes from long-term use of the land, such as that by trappers and harvesters, as explained by Trudy King (pers. comm., 2011) in the following interview exchange:

*Jennifer: Do you think that people in this community have a really strong connection to the water?*

*Trudy King: They do because the majority of the people are land users and hunters and trappers. So yeah I see that.*

As Tom Unka (pers. comm., 2010) explained, it is hard for people to know about the changes happening unless they spend a lot of time out on the land and are strongly connected to the land or to a specific place:

*It's the people that are mostly travelling on the land that know that, you know, your everyday average Joe downtown doesn't know what's happening out there, it's unfortunate because there's no communication per se to get people, they know it's low, but they haven't been out there to really see what it's like. And to really appreciate you know some of the changes that are occurring out there you have to be out there. To understand it you have to be almost standing in that water to know how much it's gone down, you know?*

Seven people, when talking about water, described it as 'our water' in conversation. This implies a certain degree of kinship or connection to water that is powerful and recognizes that water is part of everyone in the community. 'Our water' is a way of relating that connection. When one delineates something based on 'ours', 'yours' or 'mine' there is a certain degree of intimacy or connection that is implied, and a link to identity that can be established<sup>18</sup>. There were many instances of 'our water' throughout the analysis of the interview transcripts (including the statement from Violet Mandeville [pers., comm., 2011] at the beginning of this section), focus group data and photo essays, and a snapshot of some of these statements is captured below:

- *You know, our source in the water, we're surrounded by water and our main intake of our bodies is water. (Wilfred Beaulieu, pers. comm., 2011)*

---

<sup>18</sup> Note: often use of possessive pronouns often implies an ownership over something. This is not how this concept is approached here. Rather here, it is used as a way of exploring identity through deep connection, in that if you call water 'our water' there is certain degree of identity that can be inherent in that.

- *And I'd like to have local monitoring so we'll know for sure what's happening with our waters. Public knowledge!*  
*Our water is so important and we lose our water, what are we going to do? That's scary. (Trudy King, pers. comm., 2011)*
- *Yeah! It is a big concern because for years we've been saying it's the tar sands affecting our water and stuff, and just recently a study was on the news there, saying it is the tars sands that are really polluting the water. (Rocky Lafferty, pers. comm., 2011).*

#### **4.6.1 Place Identity Constructs Associated with the Theme of Identity**

The above section addressed specific participant expressions of identity, including the use of 'our water' to describe waters in the region. As this theme was specifically about identity, and as it is derived from relationship with and use of places, it is apparent that place plays a critical role in shaping individuals' self-conception. These identity constructions, as outlined above, draw strongly on the other themes discussed in this Chapter. We can see emergence and presence of specific place identity constructs through the above broader discussions of identity, most notably, environmental skills (11 responses) and rootedness (five responses). Sense of belonging, continuity, self-esteem and commitment to place also emerged, with four, three, two and three responses respectively.

Environmental skills involve intimate knowledge of how to understand, use and behave in a place, typically shaped by repeated use, and deepened by long-term use (see Chapter Two). Respondents such as Arthur Beck (pers. comm., 2011), Tom Unka (pers. comm., 2010) and one male land user (Anonymous, pers. comm., 2011e) indicated that understandings and observations of change were informed by intimate knowledge of the land. This indicates an 'insiderness' with a place, as in order to truly know whether changes are occurring, one must have a long standing connection with that place and know it intimately. For others, like Raymond Simon (pers.

comm., 2011), identity or connection with place comes through sustained use of that place, and how others perceive people in relation to the places they use.

Feelings of rootedness also emerged through analysis of this theme, which is not surprising given the importance of heritage and culture in shaping place identity (see earlier section this Chapter). This can extend to ‘place’ or the ‘land’ feeling like an extension of one’s being. This was apparent in this theme, as described in the quotations above from Arthur Beck (pers. comm., 2011), Diane Giroux (pers. comm., 2010; also earlier in this chapter, in the section on ‘heritage and connections to the past’), Violet Mandeville (pers. comm., 2011), and one female land user (Anonymous, pers. comm., 2011b), who described being part of the land, and the land being part of them. Tom Unka (pers. comm., 2010; in the next section, under ‘water is life’) describes the delta as a community larder, and that what happens in the delta is felt by the community. This further highlights the intimate, iterative relationship between people and water in the region.

Changes to the water (Chapter Five) can disrupt the continuity of a place, potentially resulting in a loss of ‘existential insideness’ or sense of belonging. As noted earlier in this Chapter, changes or loss of place can also serve to disconnect feelings of rootedness. These experiences will be discussed in Chapter Six. The implications of loss of identity, via loss of sense of belonging and rootedness, will be discuss in Chapter Seven.

#### **4.7 ‘Water is Life’ and the Importance of Respecting Water**

For people in Fort Resolution, water is seen as fundamental for life – for people, animals, plants, and all the living world. Water is life, gives life, sustains life and it is imperative that it is



protected and respected. 22 participants discussed the theme 'water is life', including discussions about providing offerings to ('paying the water') and respecting water and the interconnected nature of all parts the system (holism). Water is life was also a large part of the focus group discussion.

Without water, nothing would live. This idea was recognized and advocated by community members in Fort Resolution, as well as at wider regional and territorial levels. Simply, put, 'water is life,' and provides and sustains the life force for all of creation. This was described by regular land users and harvesters, as well as other community members who use the land and water in varying degrees. Female community member Violet Mandeville (pers. comm., 2011) explained that water is the spirit, is a part of our bodies, and is alive. Without water it not possible to live, so it is important to respect it. Community member Lloyd Norn (pers. comm., 2011) also described this critical relationship between water and life:

*Jennifer: So then, the land and the water it's very important for quality of life?  
Lloyd: Oh yes, that's the core. The core of existence.*

Trudy King (pers. comm., 2011), who is a female community member, emphasized the importance of water for all living things:

*It's life. Water IS life because without water you can't survive. And it's not only for humans, it's for the plants and the animals as well.*

Community-member Darwin Unka (pers. comm., 2011) described how water is important for all living things, and how contamination to that water can have profound impacts on all living things:

*Because you know, everything lives of water. If you poison the cup that everyone lives on that cup...Animals live on water, nothing will survive without water, you*

*know that. Even the plants, little bugs, everything, lives on water. So if you take that water away from us, we ain't going to survive anymore.*

One Elder male trapper (Anonymous, pers. comm., 2010b) echoed this, by stating:

*Well, that's our life you know! Without it, if we don't drink it, and we lose all the water, we're going to be like those countries [that] can't plant anything, and we can't eat anything in it. You know? And then what the hell we are gonna do here? Water's very important.*

Even participants who do not travel on the water or in the bush very often talked about how important water was for everyday life. For example, one older community member (Anonymous, pers. comm., 2011h) stated that water is important, because we use it for many things including for washing and cooking.

Three participants in a focus group also identified the importance of water for life, with one community member indicating that water looks after people (Focus Group Participants, pers. comm., 2011). In the focus group it was identified that water is not only life for people, plants and animals but it is also the source of livelihoods for members of the community. The importance of water was also recognized at the regional level, in the 2008 documentary 'Tu Beta Ts'ena' ('Water Is Life') (Akaitcho Territory Government, 2008).

When something is considered fundamental to life, changes to it can have profound impacts on people, and threaten their 'core of existence', as described above by Lloyd Norn. This can threaten place identity, and in turn, have far-reaching impacts for health and wellbeing, social relationships and cultural/traditional practices. This will be further discussed in Chapter Six.

Five of the interview participants discussed how water was honoured through personal, cultural and spiritual practices, as did participants in the focus group. In one of my first boat trips

in the community, I was taught to offer something to the water at the start of the trip (the offering can vary, but often tobacco is used). This was to pay the water out of respect for its power, and to ask for safe travels and offer thanks to God/Creator for being there (Participant Observation, July, 2009). Several participants described paying the water in this way. Community member Catherine Boucher (pers. comm., 2011) described the importance of paying the land and water, because you are always taking something from the land. She explained,

*You're picking berries or you doing something on the land when you go out. You're always taking something, even wood...so you pay the land most of the time. Like sometimes you use shells, you know 22 shells, or matches. Just something to offer. Mostly tobacco though.*

Elder and land user Angus Beaulieu (pers. comm., 2010) discussed the cultural and spiritual aspects of paying and respecting the water:

*We use the water for travelling and for drinking and for everything and you know we use [water] for traveling in the winter on the ice, in the summer by boat. And nobody can live without water. We respect the water. In the spring, the way my grandfather taught me is, the first time we get in the boat in the spring, we dip our hands, we're Catholics, most people are Catholic in Fort Res here, we dip our hand in the water and we make the sign of the cross. Respecting the water, and we put tobacco in the water. I still do that today. That's what I was taught. To respect the water.*

Respecting the water is a practice still handed down from Elders to younger people in the community, and many people still do it. Participants in the focus group (Focus Group Participants, pers. comm., 2011) also described the importance of paying the water – and passing those teachings on to younger generations – because the water looks after you. The water is powerful and it can kill so it is important to treat the water with respect at all times.

Interview responses throughout almost all interviews and the focus group conducted reflect a holistic view of the world. This holistic view recognizes the relationships between water,

people, plants, animals, air and ecological health. At the foundation of this is the importance of water in connecting and maintaining the relationships between all living and non-living things. Some people described how water makes up everyone and everything, and that all living things need water to live, making it fundamental to the make-up of people, plants and animals. FRMC environment staff person Tom Unka (pers. comm., 2010) described how the community is a ‘delta community,’ in that the delta is part of the people and vice versa, and all aspects of the delta environment are intimately connected:

*That’s where we’re living. We’re a delta community. And anything that happens in the community or in the delta will be felt by the community, you know. If there’s no birds, the people suffer. If there’s no muskrats, the people [suffer].*

He went on further to explain how the delta and the river are the ‘lifeline’ of the community, and maintaining the health of the delta maintains the health of the whole ecosystem, and in turn of the people who rely upon it. As he described<sup>19</sup>:

*Well, the lifeline to the delta is upriver. You know that river going upstream? That’s the lifeline. And if anything that happens to that lifeline, [it] is going to be felt in the delta, whether it’s a lowering trend, or whether it’s pollutants coming down or whatever...it’s going to change the delta you know? Low waters will change the delta. High waters nurtures the delta, you know, so there’s a fine line there, there’s a balance there that works one on one with the delta. You know if you have a really high water [year], you have a lot of muskrats, all the birds are feeding there, because all the feed is been soaked and they can feed it now....*

*...But if you don’t have flood, the birds aren’t landing there, the muskrats are gone, you really feel the impacts of the water, and being a delta community, that’s our larder. That feeds the community, you know, what we don’t supply to our people through the store-bought food we get it from the delta and it’s you know, and seasonally, like in the springtime and that, it brings a lot of food to the table, with the migratory birds, the spring hunt muskrats, beavers are harvested, along with whatever else is there, like moose, and that, so. It’s a community larder, and if we don’t get the proper feed for the water from upstream, that whole way of life is going to change for the people also. Whatever the delta does, we’re going to feel it, you know? That’s our lifeline.*

---

<sup>19</sup> Note: Parts of this passage have been condensed for space, and pertain specifically to the theme at hand.

This idea of the lifeline – that the health of the delta maintains the health of the people, both emotionally and through physical health benefits – bears significant overlap with the ideas presented in the health and wellbeing section (section 4.2). The quotation from DKFN Environment Manager (at the time of interview) Patrick Simon (pers. comm., 2010) in section 4.6, being delta people, also highlights this. Community member Wilfred Beaulieu (pers. comm., 2011) also described how people are made up of water and therefore depend on their water source to sustain them, as evidenced in his quote about our bodies being water presented in section 4.6. Approaching ecological integrity from a holistic perspective is an important tenet of Traditional Ecological Knowledge. This approach to ecosystem protection and water stewardship is a critical avenue for watershed management and can potentially contribute to adaptive capacity, as will be discussed in Chapter Seven.

#### ***4.7.1 Place Identity Constructs Associated with ‘Water is Life’***

Within this theme, the two place identity constructs that emerged most strongly were continuity and security (see Chapter Two). The focus group participants, and 15 interview participants gave responses that were related to continuity of water and place. Seven participants provided responses around security. Additional constructs, including sense of belonging (four responses and focus group participants), rootedness (three responses and focus group participants), self-efficacy (one response) and environmental skills (one response) also emerged, but with less strength.

Given the perceptions of rapid change occurring to water and important places (see Chapter Five), it is not surprising that ‘continuity’ emerged strongly. Water sustains life – it has in the past, it currently does so (though there are concerns, see Chapter Five), and should do so

into the future. The people quoted above (e.g., Trudy King [pers. comm., 2011]; Focus Group participants [pers. comm., 2011]; Tom Unka [pers. comm., 2010]), as well as others not directly cited) noted that all living things need water and that all parts of the system are interconnected (holism). As such, it is important to pay the water and to show respect to the life force. As Darwin Unka (pers. comm., 2011) noted above that all living things drink from the same water, and poisoning that water will affect everything. Therefore, it is important, as the participants above noted, to protect and respect the water to keep it safe and clean continuously into the future (e.g., Darwin Unka [pers. comm., 2011]; Angus Beaulieu [pers. comm., 2010]; Focus Group Participants [pers. comm., 2011]; Catherine Boucher and Leandre Beaulieu [pers. comm., 2011]). This protects all living things in both present and future generations. If the water remains the same, it continues to support the strongly expressed principle that ‘water is life’. If people and animals can no longer drink (or perceive that they can drink) the water because the continuity of place has changed, this may potentially impact place identity (see Chapter Six).

In terms of security, as noted throughout this chapter, being on the land allows people to feel like they can do what they want and accomplish goals they set for themselves (see for example, sections 4.3 and 4.4). People are able to feel like this because the land is safe and secure and creates a safe space within which to be one’s best self. With community-identified changes and concerns about the safety of water quality (see Chapter Five), security of place is being threatened. For example, participants Tom Unka (pers. comm., 2010) and Darwin Unka (pers. comm., 2010) described above how the community depends on the water and other components of the aquatic ecosystem to sustain people. They also described changes that are taking place that may affect the perceived security of the water. As water sustains life, without clean, healthy water there is no safety and security in the land. Without security, many people

may choose to use the land less or in different ways, which could serve to disconnect people partially or fully from important places. This can then potentially impact place identity (see Chapter Six).

#### **4.8 Connections to Other Communities - Identification with Challenges and Solidarity**

Connections to other communities, and feelings of solidarity with other places, were identified by 14 participants, as well as discussed in the focus group. This was also a theme I heard near-daily during my time in the community. Fort Resolution is not the only community in the NWT or in Northern Canada facing issues of changing waterscapes or raising concerns about impacts to water quantity, quality and aquatic ecosystem health. One of the most powerful instances of similarity comes from the experiences faced by the residents of Fort Chipewyan, Alberta, who are immediately downstream from oil sands development, and have been plagued with an increase in rare cancers and presence of abnormal fish (CBC News Edmonton, 2010). Fort Chipewyan residents have been extremely vocal about these impacts and where they believe they may be coming from – oil sands development in Alberta.

Throughout the process of conducting this research, it became clear to me that community members in Fort Resolution feel a solidarity with people in Fort Chipewyan, as they are experiencing similar challenges and have similar concerns related to water, health and fish.<sup>20</sup>

A common discourse about water change has emerged at the community level in both Fort

---

<sup>20</sup> It is important to note that feelings of solidarity can come from other experiences than changing water conditions. For example, cultural connections, family connections, residential school experiences and decades of oppression, can all serve to create solidarity, as can recent events such as the Idle No More movement. Though I acknowledge this here, I have chosen to focus only on feelings of solidarity that have arisen from community-identified changes in water conditions, which have been linked primarily with health issues.

Resolution and Fort Chipewyan, as well as throughout the broader NWT – primarily that oil sands development (as well as other developments such as pulp and paper) is a major driver of declining human health, water quality, bird populations, fish health and water quantity<sup>21</sup> (Pembina Institute, n.d.; Sherk, 2006; CBC News North, online, 2008; Horner, 2010; Hume, 2012). With this shared discourse has come a shared identity – an identity that is founded in strong connections to water, and of a people (or groups of people) who are being affected by forces outside of their control.

In my time in the community, many people talked about what was happening in Fort Chipewyan, and how it was very similar to Fort Resolution, or could be what happens in Fort Resolution in the near future (Participant Observation, Author, 2009-2011). This feeling of solidarity was also described by 11 of the interview participants, and discussed in the focus group. These participants described how the waters in the communities were connected, and flow together, and they are sharing the same water. This reflects the concept of holism (described above in section 4.7.3), and that connections to ‘place’ can exist outside of the local, particularly when parts of local place are shared or intricately connected to other places (such as Fort Chipewyan and the Peace-Athabasca Delta, which connects to the Slave watershed). In the case of these two communities, it is not only parts of ‘place’ that are connected (via the water), but experiences in those places and between those places.

Because the water is connected, many feel there is a strong likelihood of similar things happening across many northern communities, particularly with reference to increasing cancer rates. As Elder and land user Lawrence Fabien (pers. comm., 2011) explained, some of the

---

<sup>21</sup> Water quantity is at times linked by community members to oil sands development. However, declining water levels are more strongly attributed by community members to the Bennett Dam in British Columbia.



effects may not be present now, but based on experiences of other communities are sure to show up soon:

*We talked about that in that workshop there, we had fish with cancerous things and that, but it hasn't really shown that much here. Well, talking to people in Smith and Chipewyan, it's more in that area, although I'm sure it's going to be, it'll show up here. Hmm mm... Yeah it all comes down the same water system eh? It's going to come down, and it'll show up and big time, if it's up there like that up in Chip.*

Elder community member Leonard Beaulieu (pers. comm., 2011) described how Fort Chipewyan residents were the first to sound the alarm about impacts to water, and his perceptions of the magnitude of the impact:

*You know, Fort Chipewyan was the one that started that. They knew their water was being spoiled. So they started complaining, complaining, nothing being done. Finally people start[ed] dying. 19 people one summer died of cancer [in] Fort Chip.*

He also discussed feeling like there was nothing that could be done, and the government was at fault for that. This will be discussed further in Chapter Six.

Feelings of solidarity with communities other than Fort Chipewyan were also raised by seven participants as well as focus group members. For example, as land user Ron Beaulieu (pers. comm., 2011) explained:

*But the water eventually ends up here. And we, we're going to get the worst part of that water is going to end up here. And then not only people around the Great Slave Lake, it flows in the Mackenzie River, it's going to affect all the communities down the Mackenzie right to the Beaufort. We're the first ones who'll have the effect of it, but eventually they're all going to have the effect of it.*

These shared connections and feelings of solidarity point to the importance of considering 'scale' when thinking about place identity. While place identity is inherently locally-based, a person can experience differing 'scales' of place identity, ranging from the local to

regional, and from to national, to “citizen of the world” (Lewicka, 2008, p. 212; see also Lalli, 1992). Massey (1997; see also Chapter Two) describes a ‘global sense of place’ and the need for reframing the way in which we examine and consider person-place bonds. With increasing globalization, technology, connectivity, and multi-lateral flows of information and people, it is increasingly possible for connections to ‘place’ to be open, inclusive, and expansive beyond the ‘local.’ It is also possible for increasing connectivity and flow to disconnect people from their local as well as global place(s), and to create exclusion, defensiveness and inward-thinking (Massey, 1997).

Water, and shared experiences of and connections to water, appear to be both intimately local and broadly transcendental in Fort Resolution. As such, place identity experiences, in relation to water, are experienced at multiple scales (Lewicka, 2008). Common struggles or shared experiences can create a shared identity, which can be a huge impetus for engaging people in collective action. In the focus group, participants discussed the importance of connecting communities together and getting everyone involved (Focus Group Participants, pers. comm., 2011). Identification with the challenges and struggles of the residents of Fort Chipewyan can create opportunities to build on this shared identity, both within the community and with other communities in the NWT, Alberta and beyond to engage in action to protect water. With respect to changing water conditions in Northern Canada, these connections of solidarity can be framed by movement of information and people within and between spatially disparate places, as well as a globally driven need for natural resource extraction and production. This will be discussed further in Chapter Seven.

## 4.9 Chapter Conclusion

Interviews, a focus group, documents, photo essays, and observations show that water is an important part of life for community members in Fort Resolution. When asked if water was important, or specific places that mattered to people, people talked about land and water, people and animals inseparably, as they are seen intimately connected by community members. Water provides opportunities for travel, food, recreation and cultural celebration. It is a thread that connects all people in the community together, and connects them to other communities located within the greater Mackenzie River Basin. Water, as well as specific places, appear to contribute to place identity for many people, as evidenced throughout this chapter. This can range from contributing to cultural and heritage connections, health and wellbeing, social experience, and what the land provides, to the respect and honouring of water and connections. Within the six place value themes we see emergence of many place identity constructs, including sense of belonging, rootedness, self-esteem and self-efficacy, and continuity of place. While the experience of place identity is individually nuanced, the strength of these constructs points to common experiences related to how places influence and shape place identity within Fort Resolution. Solidarity with other communities, based on common struggles and shared identity, was also raised by community members. Overall, in Fort Resolution, water and place-based identity is strong, but may be threatened by changing water conditions, which will be discussed in the next Chapter.

## CHAPTER 5: COMMUNITY PERSPECTIVES OF WATER CHANGE IN THE SLAVE RIVER, DELTA AND OTHER IMPORTANT COMMUNITY WATERWAYS

### 5.1 Introduction

In this Chapter, I focus on the perspectives of water change identified and experienced by community members in Fort Resolution. This includes the nature of the community-identified exposures to a particular risk or threat, as well as how sensitive community members feel that they are to those exposures (exposure-sensitivities). I draw on anecdotal evidence and observations shared by community members during the course of this research, drawn from key informant interviews (Elders and environment staff), broad community interviews, youth photo essays, documents, my personal experiences and observations, and a focus group (see Chapter Three). The purpose of this chapter is to address Objective 2 (see Chapter One). It is important to note that this chapter focuses on community-identified changes, through participant *experiences* and *perceptions* of changing water conditions, as well as participants' attribution of change. There are many anthropogenic sources of change, as well as natural deltaic variability (Timoney, 2007). Changes presented were expressly identified by community members who took part in this research, as were the causes to which such changes were attributed. Additionally, multiple voices are presented. Not all voices presented here are in agreement on the nature, cause and magnitude of change. This is to be expected as people perceive the world and changes to it differently, may have varying levels of attachment to water or particular places, or may have different geographic, spatial and temporal scopes.

Understanding how people perceive and experience exposure-sensitivities (with particular emphasis on water) can help unpack how such changes might be affecting place

identity (Chapter Six), and how such perceptions and experiences may shape adaptation strategies (Chapter Six) and adaptive capacity (Chapter Seven). As noted in Chapter One, community-identified changes and attributions of cause, and perceptions and experiences of such changes and cause, are very real for participants and are seen as damaging to the place identity values identified in Chapter Four. As there are many ways of knowing the world, and determining if water and land are healthy, it is important to examine and understand people's experiences of change in order to understand how they are dealing with that change. People's local and Traditional Knowledge of an area and of change provides one line of evidence for understanding how change is occurring and potential approaches for addressing it (see Chapter Three).

Furthermore, as noted in Chapter One, for community members in Fort Resolution, the environment and all of its components (including people, water, land, animals, etc.) are intimately interconnected and not delineated into categories. As such, though this dissertation focuses on changing water conditions to places that matter to people, discussion often includes community-identified changes to land and other aspects of the environment interchangeably with water. Changes to land and the environment are seen as a function of changes to water. As such, additional changes related to fish, wildlife, vegetation and climate, are touched upon here, but are beyond the full scope of this research. Readers interested in additional environmental change are directed to Wesche (2009) for a detailed discussion.

Emphasis in this chapter is on the Slave River and Slave River Delta, which are key ecological and cultural resources within the Deninu Kue and Métis Traditional Territories (see Chapter Three). While most of the information relates directly to the river and delta, some interview participants also chose to provide additional information regarding change in other

areas of the traditional territory, such as Taltson River (on which the Rocher River settlement existed) and Little Buffalo River. These additional water bodies have been historically, and continue to be, important areas for members of the community, and as such, when information was available they were included in the broader analysis contained within this chapter.

This Chapter is divided into three sections. The first section addresses changing water conditions in the Slave River watershed. This section includes both historical information provided by participants, as well as contemporary experiences. Primarily, this section highlights participant perceptions of change from past to current timeframes. The second section focuses on participants' future projections and concerns for the Slave River, Delta and other areas of community importance. The third section provides brief comment on information from the instrumental record as another 'way of knowing', including in relation to attributed causes of community-identified changes.

## **5.2 Changing Water Conditions in Important Community Waterways**

In this section, I present three key themes that emerged around changing water conditions: 1) water quantity, levels and flow; 2) water quality; and, 3) weather and precipitation. As noted earlier in this chapter, changes in these three areas are also seen as having impacts on plants, animals, fish and people. Such community-identified changes have impacted the ways in which people use the land and water, including changing access to important places (whether used for hunting, fishing, ceremonial/spiritual use, recreational activities, etc.), ability to hunt, trap, fish and sustain traditional subsistence activities, and comfort in drinking raw source water.

Identified exposure-sensitivities here reflect historical and contemporary conditions and identified changes across time scales.

### ***5.2.1 Water Quantity, Levels and Flow***

Having the proper amount of water flowing through a river or into the delta or a lake is important for maintaining aquatic ecosystem integrity. Having the right amount of water also ensures that people can travel on the river to places that are important to their identity, and engage in activities that are important to them. As will be noted in this section, community members in Fort Resolution have perceptions about the appropriate levels of water in the Slave River, Delta and other important community waterways. Additionally, community observations are revealing changes to what is considered ‘appropriate’ or ‘acceptable’ for both sustaining all parts of the environment, as well as people’s activities within it. Almost all participants discussed observations or perceptions of change in water quantity, levels and flow, from the past<sup>22</sup> to contemporary times. Changing water quality was also discussed in the focus group.

Natural variability is an important part of the Slave River Delta. Elder and land user Angus Beaulieu has documented changes (natural variability) in the Slave River Delta for many years, using observations and aerial photos of the delta (Angus Beaulieu, pers. comm., 2010). The main outflow channel from the main river stem into the delta and to Great Slave Lake has changed many times. As Angus described, for many years Steamboat Channel was the main channel, until ice jamming and flooding caused the outflow to switch to the Middle Channel. The

---

<sup>22</sup> Note: ‘the past’, as a term/spatial construct, is used loosely here, to allow for reflection on different participant experiences. Many participants, young and old, described differences between the past and now. Most of the changes described have occurred within one generation (within participants’ temporal frames of reference). Some participants provided information passed down to them from their parents, grandparents or Elders, as well as Traditional Knowledge spanning generations. Where possible, specific time frames are given. All changes identified represent changes that people are feeling and experiencing as problematic.

Middle Channel then switched to the East Channel, which was the main outlet for a short period of time before changing again. Today, the ResDelta Channel is the main channel (Angus Beaulieu, pers. comm., 2010).

A perceived drying trend throughout the area was noted by Fort Resolution community members, with many stating that the overall watershed has been much drier in recent years than in the past. Elder Pete King (pers. comm., 2010), described the changes he has seen with respect to water levels:

*No more lakes, all dry up. Country's dry. My young days, between here and Rocher River, this world is just like it's floating with water, not today. To me it's like that because I paddle through the country, right from here, paddle right through to Rocher River, across the country! No portages no nothing...I went through there with a canoe, my young days, paddling, across the country. But now, the sloughs are all dry up. No more paddling through there, all the willows, trees, poplar, everything grown up.*

Elder and land user Angus Beaulieu (pers. comm., 2010) described how it was possible to travel all around the community and in the delta through the channels:

*Yeah it was so nice before. You can go from one channel, you could switch to another channel. There's a lot of channels here [where it] doesn't really show good, but you can zigzag all around, just about all the way from Fort Res and you go up one channel and back to the lake and kind of...you can't do that now.*

Elder Doris Beck (pers. comm., 2010) also explained the drying she had observed in her lifetime, in an exchange with the author and a community researcher:

*Catherine: And you'd think that the, when the ice caps are melting, you'd think there'd be more water?*

*Doris: but the sun dries it, 'cause it doesn't rain like before. We don't get as much now [as] when I was a kid. When I was a kid, we used to, every day get rain, maybe twice, then the sun's out again, there's lots of berries, everything. Now nothing. Everything dries up. No rain. That's the reason too I think we're getting short of water.*



*Jennifer: 'cause you're not getting the rain and snow anymore?*

*Doris: Not much snow, now. Years ago used to be lots of snow, lots of rain. When I was a kid.*

Doris also described how the temperatures have changed, and later in her interview the effect this might have on the drying she has seen:

*Oh, that was cold weather. 40 below's just warm for us those years. We used to get 90 below, 80, 70, goes down to 60 we'd get so happy, 40 below, oh...just warm [laughs]...*

*It's getting all dry. Can't get in the little sloughs [laughs], all dried out....I think it's the reason. It's not hot weather like years ago...water just disappearing. Used to be really hot weather in the summer when I was a kid...I remember, 1950, really high water that time. And we used to get lots of rain, now you lucky you get rain three times a summer. There every day, sometime twice it rains.....get lots of berries and everything, lots of water. It's so hot in the summer, never gets that hot now, how come everything's drying out? It's that dam doing that I think.*

Many residents recall higher levels in the past than what can be found today. For example, as land user Warren Delorme (pers. comm., 2010), a long term land user noted:

*We're losing our water. It's dropping, and it ain't dropping by the inches - It's dropping by the feet or metres....Big change yeah. In the last 15 years a big change. No more shortcuts on the Slave River. Anywhere like, even all in the delta there's places you can't even go in the Slave River delta now, 'cause there's no water.*

One active female land user (Anonymous, pers. comm., 2011b) has also observed the same thing:

*The water dropped BIG time [laughs]. It dropped about say about 18 inches, probably, because you could see rocks sticking out of the water. Before you never used to see those rocks.... it is, everywhere because even out here in the bay here there's a reef that you couldn't see before, like lots of people broke their kickers<sup>23</sup> on that reef before, but now you could see it it's sticking out of the water 12 inches. So the water has dropped big time.*

---

<sup>23</sup> 'Kicker' is a colloquial term for an outboard boat motor.

One identified indicator of water level change, as noted by six participants, was the presence of large boats using the Slave River and travelling in the delta. In the past, steamboats and other barges used to travel up and down the Slave River, hauling freight and mission workers to and from the community (e.g., Angus Beaulieu, pers. comm., 2010; Doris Beck, pers. comm., 2011; Pete King, pers. comm., 2011). Steamboat Channel, in the SRD, was named after these boats. The majority of the participants who mentioned this were Elders. They remember (or remember hearing about) these boats travelling on the Slave River, coming to the area, Mission Island, and Rocher River (e.g., Paul Smith, pers. comm., 2010; Doris Beck, pers. comm., 2010; Henry McKay, pers. comm., 2010; Lena McKay, pers. comm., 2010; Angus Beaulieu, pers. comm., 2010). Many noted that nowadays it would be nearly impossible for a boat to travel to the area via the Slave River and that many of the delta channels would never support large boat traffic as they once did<sup>24</sup>. Indeed, I can recall travelling in the delta with Elder and land user Lawrence Fabien, who described to me the old steamboats that used to travel up and down the Slave River. I recall having a hard time picturing these boats ever travelling the area because many of the passes currently appeared to be quite narrow or shallow (Participant Observation, Author, 2011).

Natural flooding in the system, as well as other nearby rivers (e.g., Taltson) was identified by participants as happening differently nowadays than it used to in the past. Participants raised concerns about both springtime flooding, and increased winter time overflow, which is identified by community members to be linked to the Bennett Dam. Changes in flooding were identified by 11 people, including Elders, and active land users, including older, and younger land users.

---

<sup>24</sup> Although one younger adult participant identified boats using the area presently to take things down to Fort McMurray.

Elder and regular land user Gabriel Lafferty (pers. comm., 2010) stated that flooding had changed when asked when he had started noticing changes, *'in about last 15 years. We used to get really bad floods on that [Slave] River. We never had floods for I don't know now many years. No water at all.'* Younger land user Jonathan Delorme, who was also an environmental resource staff person with FRMC at the time of his interview (pers. comm., 2010), echoed this, explaining:

*Like this year alone when we went out spring hunting just this past spring, we were hunting geese in our runners, standing on dry land. Our boat parked right next to dry land and you could walk around with runners on. Where even ten years ago, it would be flooded. The last few years we noticed the delta stopped flooding in the spring.*

Many community members associated the changes in flooding (and indeed, many of the changes on water levels) with the Bennett Dam, as well as changes in climate and weather. As land user Arthur Beck (pers. comm., 2011) explained:

*And also we haven't been getting really cold weather, real cold winters anymore, so we don't get that major flood in Slave River like we used to. So a lot of our creeks and our delta's drying up because of it. Because we don't get that major flood, and they're holding back water from Fort McMurray and the Bennett dam.*

Changes in the current of the Slave River were highlighted by five participants, in that it does not move as fast as it used to in the past. As Elder and land user Paul Smith (pers. comm., 2010) explained:

*All the time we went up this fall there, whenever you stopped the kicker or something, you go way back about at least 200 metres in less than 5 minutes, now you stop a kicker, it don't even move! You're practically 5 minutes about from here to the road, you float down. Before it used to be like there's just like there's little whirlpools all over the place, current, but now there's no current on the river. Even the Nagle right here, coming in, water dropped so much, they*

*have to mark it. From the Slave into Nagle. The kicker touches the bottom there.*

25

This was also discussed by Elder Pete King (pers. comm., 2010):

*There's no current now! Yeah the old days...[moving with a] three horse Johnson, just like a little rat swimming, and now there's no current...The old days the current so strong, you travel by the...just go like that boy just grab you.*

With the declining water levels, it is increasingly difficult to travel to places frequented for hunting, trapping, fishing and other important uses. Community-identified changes to access, and concerns around this, were raised by 18 interviewees and the focus group participants. For example, as younger land user (and FRMC environmental staff person at the time of interview) Jonathon Delorme (pers. comm., 2010) noted,

*Just as far as a few years back, like four or five years back there was places in the delta, like channels that we used to use to hunt moose and geese and stuff in there, but we can't access now because the sandbar, and water levels dropped...*

*Big change. Some channels are drying out, and others are just...more and more grown in.*

Additionally, participants identified seeing more sandbars in the Slave River, tributaries and in Great Slave Lake, as well as rocks not seen previously. For example, as one Elder and active trapper (Anonymous, pers. comm., 2010b) observed:

*In Slave River too, it's pretty low, travelling with a boat I could see lot of new sandbars coming up, there's a few islands coming up, in a few places we can't get there anymore, down the delta we can't, get stuck if we try to go there, so we've got to go by the main channel, either Jean or Slave to get out on the lake. And this year across the bay here, pretty soon that's going to be just an inland lake left after because all that sandbars right across just like from Mission Island to the Moose Deer Island, then from the other side here...There's a sandbar between and when there's waves you could see it's a sandbar right across. You*

---

<sup>25</sup> Paul Smith (pers. comm., 2010) also identified lack of current in Taltson River, as did Doris Beck (pers. comm., 2010).

*know the rollers hitting it? So it's only about a foot deep. So if it drops anymore that's going to be, and the sand pushes up and billows up...and makes it bad.*

With the low water levels, as noted by Jonathan Delorme and the trapper above, many areas are also growing in and seeing an increase in vegetation. The increase in hazards such as sandbars and rocks, coupled with the overall observation of declining water levels, is making it increasingly difficult to travel to many of the places people used to go. This can influence the ability of people to support traditional livelihoods, and may potentially impact environmental mastery and place identity (discussed further in Chapter Seven).

As noted earlier, and evident throughout many of the statements, changes in water levels, flooding, and loss of access to places was primarily linked to the Bennett Dam's operations. 10 interviewees, as well as focus group participants, explicitly identified the Bennett Dam as a potential source of water change in the region. The lack of consultation regarding the development of the dam has likely contributed to community members' mistrust of the Bennett dam (Wesche, 2009). In addition, perceived unnatural flooding influenced by the Bennett Dam has had severe impacts on animal species in the delta, including beaver and muskrats:

*Because I lived here, so that's how I know the way it used to be. And it's nothing. So that's what the Bennett dam done to us. And what I'm worried about now is well, I've been worrying about it, what a person can do? Bennett Dam there, they just let water go in the winter... So any water you let go, the rats<sup>26</sup>, [the] very little rats that we have [are] on the river, and they got their [homes] on the delta here, they got their holes in the ground...but when you let a lot of water go, middle of the winter, they all drown. Same thing with the beaver. If they chew their way out, they'll freeze, they just die in their beaver house... You know they need more electricity, that far [away in B.C.] you wouldn't think it would affect the delta, but it does. (Elder Angus Beaulieu, pers. comm., 2010)*

---

<sup>26</sup> 'Rats' is short-form, local term for muskrats.

In addition, the Taltson Dam was also a source of concern for community members, with nine participants expressly raising it in their interviews. These concerns were also discussed in the focus group. Taltson Dam was built in 1966 on the Taltson River (Dezé Energy, online, n.d.), a key river used by community members from Fort Resolution (as discussed in Chapter Four). The dam was built to provide electricity for the mining operation and Pine Point. Currently, the dam provides power for four communities in the NWT and Alberta (Dezé Energy, online, n.d.). A proposed expansion of the dam was put on hold in 2011 (CBC News North, online, May 2, 2011). As noted by Elder Doris Beck (pers. comm., 2010):

*It's changed since they put that Taltson dam [in]. That did all that damage...The prairies there across from our cabin, there's a big prairie, there. It used to be a lake! My husband said he used to trap rats and beaver on that lake. Now we went there skidoo that time, maybe about 20 years ago, just prairie. Just grass no water! You could see where beaver lodge been, so the lake was just dry now. So everything's going down really low. That's in the prairies, not far from our cabin, across country a little bit. Ever low. And where we used to go to Taltson remember from Rocher River, that bay? We called Taltson Bay? Remember we used to just go with a kicker? Can't do that now, just grass. Can't run a kicker, it's too shallow too now. So all the lake. Even here. We're gonna have no water pretty soon I think. It's really going down. When I was a kid, oh boy lots of water. Ever. Good water, good fish. Now even the fish are not as good as before when we were kids.*

Elder and active trapper Henry McKay (pers. comm., 2010) also explained the impacts from releases from the Taltson Dam:

*If they're holding water back they should let it go. Wherever they're holding it, they must be holding it someplace, the dam, you know? Maybe it's happening here that I didn't see it, that Rocher River, one time they let the water go in the winter time, they drowned lots of beavers and stuff like that because... they're under the ice and they fill up their lodge and they didn't have time to go dig a hole, they found lots of drowned beavers, those people that trap around there....still talk about it 'til today. Why are they doing [that]...beavers is going to be killed. They killed them too, for nothing.....*

In addition to the Bennett and Taltson Dams, other river regulation and hydroelectric development projects were also sources of concern for community members about the impacts of water quantity, and the timing and frequency of flooding events (Participant Observation, Author, 2010-2104). Five participants talked about concerns about dams generally, and three expressed serious concern about future dams in the area. For example, concerns have been raised about the proposed Site C dam on the Peace River in B.C. Site C would be a third dam on the Peace, in addition to the existing Bennett and Peace Canyon dams, and is being proposed to contribute to increasing power demands of B.C. residents (B.C. Hydro, 2012). The project is currently in the environmental assessment phase (B.C. Hydro, 2012). While BC Hydro indicates that Site C will provide a cost-effective and clean source of energy (B.C. Hydro, 2012), many residents downstream think that it may continue to impact ongoing water quantity changes (Patrick Simon, pers. comm., 2010; Participant Observation, Author, 2009-2012).

### ***5.2.2 Water Quality***

Concerns over water quality were prevalent in the community of Fort Resolution. These concerns related to drinking water quality and aquatic ecosystem water quality. Much of the concern about water quality and contamination in the community was related to contemporary experiences, coinciding with increasing development in the region, as well as in upstream areas. Based on information collected as part of this dissertation, concerns about water quality emerged strongly and were prevalent across almost every single interview. Indeed, almost every person I talked to in town about my project, whether formally or informally, expressed concerns that the

water in the Slave and some other waterways was contaminated and unfit to drink (Participant Observation, Author, 2008-2014). This was a departure from the past, when people had:

*Fresh water, water. We didn't put anything in the water. We used to go down to the lake, haul water [and] throw it in the barrel, and drink it, eat it, that's the way we grew up. So it was pure, or clean. (Leandre Beaulieu, pers. comm., 2011)*

Many community members now seem to have a great degree of mistrust for the water flowing through their lands; this mistrust and the impact of this on community members in terms of livelihood and identity will be further discussed in Chapter Six. For example, land user Kenneth Delorme noted that the water used to be clear and the water levels high, but now the water is no longer drinkable and he only uses water mainly for washing (pers. comm., 2010). 21 people described the ability in the past to drink water from places out on the land, including directly from the lake and rivers (though often with boiling); this was often contrasted by people saying they would no longer do so. GSL was also a water source for people living in the community<sup>27</sup>, who hauled lake water and ice in barrels. Some participants indicated you could drink the water anywhere in the past. For example, several participants described the importance of being able to dip one's cup into the water and drink:

*Way back, have a cup beside you, you just dip [in] water, just drink it. Can't do that no more! (Elder and land user Henry McKay, pers. comm., 2010).*

*And when I used to travel with my grandfather on the lake, we used to dip our cup anywhere and drink water, drink our water and anywhere we went. You know just went to the lake, grab water, boil it, make tea or just drink it. But now, I don't trust it. (Community member Catherine Boucher, pers. comm., 2011)*

*I don't know but the water is not as clear as it used to be, and I used to be able to just dip cup in and drink it, and now kinda scary to do that. You know unless you go further to the East Arm, right to the other end yet (Community member Raymond Simon, pers. comm., 2011).*

---

<sup>27</sup> GSL is still the community's source water.



This was something considered special by community members, and an inherent right. Now however, people feel like they could no longer do this. Some community members stated unequivocally that they will no longer drink water from the rivers or from the lake. For example, land user and community member Darwin Unka (pers. comm., 2011) indicated he was scared to drink the water because of perceptions of contamination:

*I'm scared even to drink the Slave River water anymore, right from before I used to do that. You don't see as much animals on the Slave River like before. Because the water, is different for them, you know? Too much poisons in there you know. Would you drink that water if you were an animal and you knew better? I don't think so. Even now, when I go up that Slave River now, I bring five gallons of water, my own water....I wouldn't trust that water. You get foam, big chunks of foam...and the growth in the delta is more.*

This fear was also shared by land user Warren Delorme (pers. comm., 2011) who talked about water from the land:

*But I used [to] drink the Slave River water, but I don't anymore. Been a few years now since I stopped doing that.*

One female Elder (Anonymous, pers. comm., 2010c) stated that something should be done about the water, and that there are some people in the community who boil tap water in order to drink it. She indicated that she felt that others who do not boil their water get sick.

Five indicated they do or would (or would likely) still drink the water direct from the land, but one younger land user noted if he did it would be from the lake, and one Elder trapper indicated he would only do so from the Taltson River. A few community members indicated that they would only do so after treating it via boiling (which some people do currently as safe practice). A small number of people indicated they do not even like to consume community tap

water, or some, as one female Elder indicated (as discussed above; Anonymous, pers. comm., 2010c) above, will boil it first.

For some participants, the properties of water (appearance, smell, taste, etc.) seemed to have changed from the past. One Elder trapper (Anonymous, pers. comm., 2010a) indicated that the water looks different than it did in the past, and that in the past people would use snow for water in the winter time and Slave River water in the summer. Now, he is concerned about whether the water is okay to drink, and relies mainly on bottled water. Many community members now bring bottled water on the land with them, an adaptation to perceptions about changing water quality conditions and a strategy to alleviate concerns about accessing safe water when on the land. Not being able to access safe water on the land was perceived by many as disappointing, and for some an affront. This will be discussed further in Chapter Six.

Community members noted that water no longer seemed to taste the same, or in some cases look like it used to in the past. Others have described strange smells associated with the water. One participant vividly described the changes to the appearance of the water in the Slave River drainage system that he has both observed and heard about from other community members:

*Well, in the past we used to drink the water right out of the lake and the river and we didn't think too much about, but over the last 20 years or so, the whole water has started taking on a different appearance for one, near the surface there be more froth, bubble type....sheens, you get, in the little eddies you can almost see the little hydrocarbon sheens, little rainbows in the waters and stuff like that... (Tom Unka, pers. comm., 2010)*

As Elder and land user Lawrence Fabien (pers. comm., 2010) described changes to the colour of the lake because of changes on the Slave:

*Yeah. It's almost a dull gray, bluish gray. We never had that before and it seems like it takes the water a lot longer to turn that muddy colour from the Slave River*

*after breakup. It used to happen just about right after the breakup and now it seems that it stays clear a lot longer. Cause the current is not there.*

Additionally, in terms of colour, a handful of participants indicated that they were observing less dirt (sediment) in the Slave now than before, making it clearer. Conversely, a small number of other participants indicated they felt the water was dirtier with more sediment than in the past.

AAMP coordinator Diane Giroux (pers. comm., 2010) described changes to the water that she and others had experienced:

*I know talking to Elders of course they have said that the water taste, the water itself, the smell, the texture [has changed] and I guess the best example is when they make tea nowadays. I don't know if it's related to the treatment of the water facility because they do use some chemicals like chlorine, and I think they still use alum as part of their treatment...but a lot of them [the Elders] have said that there's a film on the cup that forms that never used to, they don't remember that...*

*...water's hard to describe for me, as a taste, because it is tasteless, in a sense, so it's hard to say it's this or that, it doesn't get bitter or sweet. It's just sort of instinctual thing I guess, for me just emotionally I'll say. I don't remember the water tasting good as it did when I was I kid. I remember being a kid, we didn't have running water, we had trucked water in the barrels. But I remember our water being cold and refreshing and nowadays...you know just running it from the tap, it just doesn't have the same experience I guess.*

Many of the concerns over water from the Slave River and other places on the land were concerns over increased contaminant loadings, such as hydrocarbons and metals. One of the main concerns was the presence of contaminants from oil and gas activity in Alberta. For example, as land user Arthur Beck (pers. comm., 2011), a male community member (Anonymous, pers. comm., 2011a), and community member Raymond Giroux (pers. comm., 2011) all explained, respectively:

*You don't even, even boiling it's no good, because chemicals coming from the south. So boiling it's no good. I mean if it was just bacteria and parasites, we can boil it. But this is something else.*

*I don't usually drink water from the, from the rivers. I try not to. I bring my own. Because of the oil sands. I mean it's coming down this way, already you could probably take a study and find out you've got a whole bunch of stuff in there.*

*A lot of pulp mills and like, McMurray too...all that pollution is coming down this way eh? Slave River boy, just, the water, just gray like. Like if you take a cup of water, it's pretty dirty water.*

Land user Ron Beaulieu (pers. comm., 2011) indicated that he did not feel water coming from the McMurray was safe to drink, despite what industry has said:

*They say, like in McMurray, they say the water goes through purification plant and it's so good you could take a cup of it and drink it. I'd like to see them drink it, I wouldn't try it. No.*

Concerns about municipal waste impacts, both locally and regionally were also raised. A few participants raised concerns about the impacts of the community's sewage lagoon (e.g., Tom Unka, pers. comm., 2010; among others). One active female land user described concerns about impacts from effluent from the upstream NWT town Fort Smith:

*Our water comes from Smith and there they have a big pipe coming out of their ground like, and it goes right into the water there, so I'm scared to drink it because I don't know what's that pipe from, but it stinks that pipe (Anonymous, pers. comm., 2011b).*

Within the community of Fort Resolution, community-identified water quality changes were primarily attributed to oil sands development. The impacts of oil sands development on water quality was raised in nearly every interview I conducted in the community of Fort Resolution. People in the community also associated a perceived increase in cancer rates with perceived contamination of water quality. For example, many people indicated that they felt that

cancer in the community is on the rise, and that it was not like this in the past. As Elder Lena McKay (pers. comm., 2011) noted:

*I think there's more cancer cases in this community and it's so small, this year alone I don't know how many people died, I know it's over ten people died since January. All cancer related.*

These perceived increases in cancer appear to be directly related by community members to contaminated water or animals. As one Elder trapper (Anonymous, pers. comm., 2010b) stated:

*I mean, eventually, in the tar sands all that's coming down, look at people are dying in Chip and we've been dying with cancer all the time. Myself I got cancer. You know? Yeah...So it must be coming down because [like] Chip, everything that happened up there is happening here. And it's going to go all the way down to the coast, down to ocean there.*

People in Fort Resolution felt solidarity with those in Fort Chipewyan, as they have observed and felt very similar impacts on the surrounding aquatic ecosystem, where there have been increasing rates of cancers and observations of deformed fish (Athabasca Chipewyan First Nation, 2012, online; CBC News Edmonton, online, 2010). Many community members in Fort Resolution have perceived an increasing rate of cancer in their community, similar to the experiences of the neighbours in Fort Chipewyan. Many interview participants highlighted these experiences, and noted that many people in the community are sick. Concerns were raised not only about cancer, but also about perceived increased in *H. pylori* illnesses, which can come from faecal contamination of water sources as well as overcrowding conditions.

### **5.3.3 Weather, Precipitation and Ice**

Related to community-identified changes in water quality and quantity, participants discussed changes in weather, precipitation and ice conditions in the area. Changes in

temperature was a prevalent theme. Eight Elders and one active land user remembered much colder temperatures in the past. Today the weather, as noted by many, ‘feels warm’. For example, Elder Fred King (pers. comm., 2011) recalled his experiences of temperatures when he lived in Rocher River:

*I remember in Rocher River, I used to live there, I was just young, and that thermometer, as far as it goes 60 below, maybe more, but as far as 60, 60 below, 50 below, steady. Just, you know [in] January and February. You go outside, open the door, just draft coming in, just like smoke coming in, it was so damn cold. Yeah. And you walk on the road there, it was just like forced walking, you know, make so much noise eh? It [was] so damn cold. Everything just cracking. Trees are cracking. Everything so damn cold. Now we don't get that no more!*

One female Elder (Anonymous, pers. comm., 2010c) described how cold things used to seem in the past. In the past, in November, she described how people used to say how cold it was and that it would be too cold for the dogs or to go for traps, and they would want to stay inside. She explained that the weather has changed and in November now it seems nice out and not as cold as it used to be.

Elder Lena McKay (pers. comm., 2011), like Fred above, described it as being so cold that the snow was crispy and you could hear your feet when walking on the snow. Elder Pete King (pers. comm., 2010) recalled meeting an outsider who predicted the warm weather would come, and things would be remarkably different in the future, and how that predication came to fruition:

*I know a guy, looks like....long beard like this. His name is Fred [last name] and 1950 he come up to us...he likes bannock and coffee so [we] make that for him, bannock and coffee. [we said] ‘what’s up Fred?’ ‘I want to tell you boys what, the world is changing’, he told us. Yeah. He told us a little bit about it and then he left. And four years after that, 1954 he’s coming back again. ‘Boys remember what I told you?’ ‘Yes’. ‘From now on’ he said, ‘you’ll never see 50 below zero, 60 below, 70 below, it’s gone. Never come back. Three to four hundred years from now, you guys will be just laughing, walking on green grass all the time, everything’....It’s coming I think...things different since those times, since 1954*

*to today.....used to be 60 below zero, could not see nothing in town, foggy like. Can't go without mitts, gloves, it's too cold on us. Now I just walk around with bare hands like this. My young days the warmest was 50 below zero, not minus 30. 50 below zero! Now, since that time I watch the weather, what that old man told us. A lot of change. I never seen 50 below zero yet, 'til today since that 1954, so [laughs]. How did he know then, that old man? I was thinking about it a lot of times. My brother and I were talking about [that] a lot of times. How did he know that? Know that weather's coming like that?*

With increasing ambient temperatures have come increased water temperatures, which were identified as having impacts on fish. For example, as active land user Arthur Beck (pers. comm., 2011) explained:

*And with global warming, the lake has warmed up about three degrees, the water... That also changes the habitat of spawning. Because the temperature and the atmosphere is what sets off the fish to start spawning, and what not. So that's changed.*

Increasing temperatures in Northern climes were identified by participants as impacting precipitation and quality and timing of ice distribution patterns (which will be discussed further in this section), as well as having impacts on ability to travel on the land and engage in traditional livelihood practices. For example, participants indicated that there seemed to be less rain falling on the region. For example, Elder Doris Beck (pers. comm., 2010) described the changes she had seen:

*It doesn't rain like before. We don't get as much now [as] when I was a kid. When I was a kid, we used to, every day get rain, maybe twice, then the sun's out again, there's lots of berries, everything. Now nothing. Everything dries up. No rain.*

Observations also indicated that it seemed like rain is coming at times of the year when it did not previously occur. For example, as AAMP coordinator Diane Giroux (pers. comm., 2010) explained:

*We've also had differing weather impacts, like more rain over the winters. Like last year we had actually a few days of rain where normally we don't have winter rains... It's considered unusual I guess, but last year, and few years prior to that, we've had more rain it seems in the winter months which is not common.*

Snow was also identified by community members as changing drastically. Changes in snow were raised both in interviews and through conversations I had with many people in the community throughout my time there. Some examples include:

*Not much snow, now. Years ago used to be lots of snow, lots of rain. When I was a kid. (Doris Beck, pers. comm., 2010)*

*Less snow, cause whenever we used to come here in the fall time, before Christmas [to] pick up stuff, groceries and things, this place here, should have been least three feet in the olden days. Three or four feet snow. Now about not even a foot. (Paul Smith, pers. comm., 2010)*

*So that's where the people would normally cross, but nowadays with some times very little precipitation in the fall, like now, it's the middle of November we've only got our snow yesterday, middle of November, the early snow it usually helps the ice freeze consistently. (Tom Unka, pers. comm., 2010)*

Student Macheala Larocque (in the Grade7-8 class) also talked about ice melting from global warming in her photo essay (see Appendix I2), indicating that concerns about changes in ice exist within younger generations as well. However, it is also important to note that some participants indicated that they had not observed measurable changes in the snow.

Residents had also observed that ice on the rivers had changed, particularly with the warming weather, and potential influences from upstream development and river regulation. Change was most noted by participants who still actively travelled on the land on a regular basis. Freeze-up typically took place between the middle of October to early November, and community members have observed that the freeze-up takes longer than it used to and there is increased variability in the timing (Wesche, 2009). People have observed that break-up seems to



be shorter, with less ice jamming, which is a key hydrogeological process that replenishes the delta (Wesche, 2009). For example, as land user Arthur Beck (pers. comm., 2011) explained:

*And river ice is not even forming solid like it used to. The ice is softer. We need, to cross Slave River when I was younger, six inches of ice we could cross and now it's dangerous. You can...six inches in one spot and you turn over two feet over to the other side and you'd go right through with an axe. The ice is not it used to be, I don't know how to explain it but it's different. It's not solid, clear ice any more. (Arthur Beck, pers. comm., 2010)*

These changing ice conditions have made it more dangerous to travel on the ice during the winter hunting and trapping season, a frustration which was expressed by many interview participants, including in the quotation above from land user Arthur Beck (2010) (see also Wesche, 2009). Overall, community members indicated that changing weather was making it increasingly difficult to 'read' the land and predict what will happen next. The rapidity of the changes was most troubling for many people. For example, as one Elder and active trapper (Anonymous, pers. comm., 2010b) explained:

*Even makes it hard to travel, and the change of the ice you know, the ice, like the bad spots, it's all changing now so you got to be pretty careful out there like, where you don't expect it could be bad eh? Now, you know, like before we just knew that this water was pretty at the same level all the time back and forth by six inches, a foot eh? But now it's not coming back, it's just dropped.*

The above sections have highlighted the changes that community members are experiencing, and have identified as problematic. With the rapidity of change, as indicated in the above quotation, there are concerns about what the future of the Slave River and other waterways may look like. Future projections, as identified by participants, will be explored in the next section.

### 5.3 Future Projections for the Slave River, Delta, and Surrounding Regions

One of the key questions asked to participants (see interview protocol in Appendix H), was what they felt the Slave River and Delta (or other important places in the region) might look like in the future and what their concerns for the future were. Many described specific concerns about the future of the water in the region. For some, there were concerns that hunting and trapping will change because of declining water levels and quality issues. For example, Elder and land user Gabriel Lafferty was concerned about fish:

*I'm not sure what's doing it, but if we get down any lower, we're not going to get anything. The water is so low, you know, the fish is no good now.*

Some expressed concerns that there will be no water left in the area. For example, as one female land user explained:

*It's disappointing like, pretty soon we're not going to have that area like it's going to be dropping and dropping and then pretty soon nobody'll be able allowed out on boats it'll be too shallow. (Anonymous, pers. comm., 2011b)*

This was echoed by younger land user Jonathan Delorme (also a staff member at the FRMC at the time of interview; pers. comm., 2010):

*My concerns of the delta is it's going to dry up in future. Not going to have a delta anymore. Like this year alone when we went out spring hunting just this past spring, we were hunting geese in our runners, standing on dry land. Our boat parked right next to dry land and you could walk around with runners on. Where even ten years ago, it would be flooded. The last few years we noticed the delta stopped flooding in the spring.*

Others, such as one Elder trapper (pers. comm., 2010b) were worried about continual expansion of upstream development, and how humans have done too much harm to the rivers:

*Maybe another 20 years there be no world here, we'll be all poisoned, or something's going to happen. Too many them guys are playing god with earth. You know? You know, they're directing our rivers, and they're flooding down in other country you know what I mean? Even in Canada here eh? I mean, eventually, in the tar sands all that's coming down, look at people are dying in Chip and we've been dying with cancer all the time. Myself I got cancer. You know? Yeah...So it must be coming down because [like] Chip, everything that happened up there is happening here. And it's going to go all the way down to the coast, down to ocean there.*

One Elder recalled his grandfather giving him predictions about the future of the water in the area, and predictions from another community member's grandfather:

*There's old saying, [one community member's] grandfather predicted things, his brothers too, they all predicted things, they were all medicine men. Even my grandfather predicted TV, we're looking at TV today. Old man [name of Elder], said, 'this water' he said [to his grandson], '... you might still be alive', he told [him], 'this water's going to be unfit to drink, you can't even bath in there'. (Leonard Beaulieu, pers. comm., 2011)*

Overwhelmingly, during my time in the community, many people (both in formal interviews and in informal conversations) described being concerned about whether their children and grandchildren – as well as subsequent generations – will be able to use and enjoy the land as they had. Some participants indicated that it is no longer possible to use the land in the ways that their ancestors had. This comes as no surprise, given the importance of heritage and generational relationships to place identity identified in Chapter Four. For example, land user Warren Delorme (pers. comm., 2011) and his son Jonathan, a younger generation land user (and FRMC environmental staff member at time of interview), expressed concerns about the future:

*Oh if they don't try to fix it now, it's doesn't look too good for them in the future. We got to start working on our issues, start working together, if that don't happen then there's no future in that area for them. I mean have a little grandson that you know, Papa let's go moose hunting he tells me, Silas, he's always talking*

*about moose... He always wants to go hunting and you know, pretty soon he's gotta to start too. (Warren Delorme, pers. comm., 2011)*

*Young now, and I wonder, I'm wondering what the land's going to turn out to be like when I'm older... like 20 years down the road from now am I going to be able to do this and that they we used to? It's a big change and we gotta adapt to I guess, no way around it. (Jonathan Delorme, pers. comm., 2010)*

Indeed, fostering connections to heritage and a desire to protect the water for future generations can serve to strengthen both individual and community capacity; this will be discussed further in Chapter Seven.

Two of the youth participants expressed concerns over what the future might hold, if watershed change continues to take place. For example, Shania Miersch (pers. comm., 2011) described how the changes made her feel about the future in her essay:

*These changes make me feel like the world is ending. I begin to wonder what life will be like if this continues on? How will people in the future feel when they realize what life here used to be like? I think that we should try to help this problem be reduced. For the people of our future. They need to live our traditional life that we can live now, I believe that we will be able to let them live their life as we have lived ours.*

One female youth participant (Anonymous, pers. comm., 2011g) also described how the changes in the future could impact her, in her photo essay:

*I love going on the land because it is a great place to go with your friends to chill out. When I go out on the land with my friends we always go out on a boat. There is lots of nice scenery while being out on the water but unfortunately now days most of the channels are drying up the water is really low. It sucks because there are some places I have never been before and I don't know if I will ever get to see how it looks.*

Wesche (2009) worked with Fort Resolution community members to develop scenarios about what the community and surrounding environment may look like in the year 2025. The scenarios focused on three possible ranges of change: moderate change, a system affected by

climate change, and a system impacted by resource development (Wesche, 2009). For all three future scenarios many of the changes to environment, culture, social relationships, health and well-being, and so forth, were identified as negative or mixed impacts (Wesche, 2009). What this demonstrates is that concerns exist no matter what level of change occurs, particularly as significant change in water conditions and habitats has already been perceived, internalized and experienced by community participants.

#### **5.4 Comment on Information Available Via the Instrumental Record**

This chapter has focused on participants' experiences of change (exposure-sensitivities). Based on the above results, it is evident that the majority of participants are perceiving and experiencing changes to water quantity, quality and weather, and related impacts to access and lifestyle (see also Wesche, 2009). I touch briefly here on information from the instrumental record (e.g., a Western science perspective), as an additional way of knowing, perceiving and understanding change. Though emphasis is on participants' *experiences* and *perceptions*, information from natural science, as part of the overall identification and understanding of exposure-sensitivities provides additional context and is consistent with the CAVIAR framework (see Chapter Two). In this section, I do not aim to validate or privilege any particular way of knowing over the other. Rather, I aim to touch on and briefly explore how different ways of knowing lead to different perceptions and understandings of change, which can have implications for adaptation and adaptive capacity.

As noted above, community members have identified changes in water levels and flow, and an overall drying. An increasing trend towards drier delta conditions has been observed in

the instrumental record as well (English et al., 1997). There was a lower frequency of higher-magnitude discharge events on the Slave River in the period between 1980 and 2005, than occurred in the period between 1960 and 1980 (Brock et al., 2008; Wesche, 2009). However, it is important to note that multi-decadal dry periods are natural and have occurred in the past (Mongeon, 2008; Wesche, 2009). Seasonal variability in Slave flows appears to have changed<sup>28</sup> (Kerr, 1997; Sanderson, Czarnecki & Faria, 2012). Annual peak spring freshet flows have occurred on average six days earlier per decade since 1953, while spring peak flows have decreased by 20% in the May to October periods (MRBB, 2003; Sanderson et al., 2012). In winter months between November and April, flows have increased by as much as 75%, compared to the conditions that were present prior to construction of the Bennett Dam in 1967 (MRBB, 2003; Sanderson et al., 2012). Sanderson et al., (2012) note that changes in flows may be influenced by climate variability or by flow regulation. Brock et al., (2010) suggest that changes other than river regulation, such as natural variability and delta dynamics, have likely contributed to reduced flood frequency in the SRD. Additional work is required to disentangle effects of flow regulation from climate variability on timing, magnitude and frequency of Slave River flows. Thus, changes in flows and drying are evident in both the anecdotal and instrumental records, however the attribution (or degree of attribution) may at times vary.

Weather and precipitation changes have also been identified in the instrumental record. According to the Mackenzie River Basin Board (MRBB) (2012), overall annual temperatures have increased by roughly 2°C in the basin, with winter average temperatures increasing by roughly 4°C. The North as a whole is warming much faster than southern Canadian latitudes, and saw a rough increase of 0.5 – 1.5°C (MRBB, 2012). There has also been a shift in ‘transition

---

<sup>28</sup> Though annual total flows remain the same (MRBB, 2003; Sanderson et al., 2012).

seasons' because of climate change and increasing variability in temperatures, according to the GNWT (2008). According to the GNWT (2008, p. 10), "the amount and timing of precipitation events in the NWT are becoming highly variable between seasons and between communities." Spring 2011 was the driest on record for the region at 49% below normal, with the last four years being drier than the last 20 years (GNWT, 2009, online). Observations of declining snowpack and decreases in winter-time precipitation have also been noted in other community-based studies, and general (though variable) declines can be observed in the instrumental record (Wesche, 2009). Though the instrumental record from 1931 to 2007 shows a variable decline, it appears that such declines have happened before (Wesche, 2009).

One key area where the Traditional and local knowledge and Western science information diverge is with respect to water quality. Community members are scared about perceived increases in hydrocarbons and metals from upstream development. Long-term monitoring data has identified guideline<sup>29</sup> exceedances of some total metals (Sanderson et al., 2012). However, it is important to note that although many metals frequently exceed guidelines, it does not necessarily mean that water quality in the Slave River is unsafe. The Slave River is a large, fast-moving and very turbid river, and as such, guidelines for several parameters (e.g., iron, lead, mercury, etc.) are routinely exceeded because they are not suitable for northern, heavily sediment-laden rivers (Sanderson et al., 2012). Community-based monitoring information has also shown that hydrocarbon concentrations in the Slave, though present<sup>30</sup> are well below levels that could impact fish health (GNWT, 2013). The MRBB concluded that elevated contaminant and turbidity levels were likely due to natural sources (MRBB, 2003),

---

<sup>29</sup> Canadian Council of Ministers of the Environment Guidelines for the Protection of Freshwater Aquatic Life

<sup>30</sup> The Slave River at Fort Smith, along with sites on the Peel and Mackenzie Rivers, showed some of the highest levels of dissolved hydrocarbons in the NWT, though these are well below levels that can affect fish, as identified above (GNWT, 2013).

which points to the need for site-specific water quality objectives which are currently being developed for the Slave River (Sanderson et al., 2012). Thus, the water is generally considered safe and clean from an instrumental record perspective, though changes and perceptions of Fort Resolution community members of unsafe water are pervasive.

However, as Sanderson et al. (2012) note, certain nutrients have been increasing over time. For example, at the long-term monitoring station at Fort Fitzgerald (upstream of Fort Resolution on the Slave River in Alberta), total phosphorus showed an increase, while dissolved phosphorus is showing an increase in spring and winter (Sanderson et al., 2012). Phosphorus inputs are largely natural, though municipal effluent and agriculture can be contributing sources (Sanderson et al., 2012). High concentrations in nutrients can lead to excessive plant growth (Sanderson et al., 2012). This could potentially result in increased algae and vegetation, which could change the appearance of water quality.

Concerns about contamination from oil sands operations have been linked to the experience of Fort Chipewyan residents who are located on the Peace-Athabasca Delta (PAD). As the PAD is linked to the Slave, concerns exist that what is perceived to be happening in the PAD will eventually happen in the Slave. For example, in a review of water quality research for the PAD, Timoney (2007) found that mercury and arsenic levels appeared to be rising, and that mercury levels in fish greatly exceeded available guidelines for subsistence fishers. In addition, Kelly and colleagues (2009) found that polycyclic aromatic compounds (PACs) have increased in the Athabasca River, potentially due to oil sands production nearby (via air emissions). This has led to concerns about contamination levels downstream in the SRD. Conversely, Hall and colleagues (2012) measured PAH concentrations in sediment cores from three lakes in the PAD. Results showed that measurable increases in hydrocarbon concentrations since the Alberta oil



sands started were not detected, and the authors indicate that the likely source of hydrocarbons into the aquatic system is from natural loading (Hall et al., 2012). In companion research to the PAD work, Wolfe, Hall and Elmes (2012) indicated that based on sediment core records for lake SD2 in the Slave Delta, PAH deposition has not changed substantially over time.

## **5.5 Chapter Conclusion**

People in Fort Resolution are strongly attached to water and specific places in the Slave River and Delta (and other nearby community waterways) (see Chapter Four). People are also perceiving a wide-range of exposure-sensitivities that are having impacts on way of life, perception of safety, and concerns for the current and future states of the ecosystem as a whole. These impacts are seen as happening to the places that matter to people in the community. Community members discussed concerns about decreasing water levels, flows in the Slave River and other important waterways and overall experiences of drying in the area. Residents expressed serious concerns about perceptions of the safety and quality of water, generally, and in the places they identify with. People are scared to drink water directly from the rivers and lakes, and have experienced changes in appearance and taste of water. Finally, participants discussed perceptions of changes in weather and ice, including temperature, precipitation, and timing and safety of ice use. Overall, it is critical to understand how people perceive changes to places they love, as this will likely have implications for place identity, and cascading effects for adaptation and adaptive capacity, as will be discussed in the two subsequent chapters.

## **CHAPTER 6: IMPACTS TO PLACE IDENTITY AND RESPONSES TO WATER CHANGE**

### **6.1 Introduction**

In this Chapter, I examine how community-identified changes are impacting place identity and people's related behavioural responses to water changes and threats to place identity. As identified in Chapter Four, the land and water (both generally, and in reference to specific places) are important to community members in Fort Resolution. Places provide connections to heritage and culture, opportunities for social interactions and development of social networks, and opportunities for personal fulfillment and maintenance and promotion of health and well-being. Further to this, as identified in Chapter Five, the land and waters in and around Fort Resolution have been identified by community members as experiencing rapid change. When places change, people can experience a range of emotional impacts, including grief, anger, sadness, yearning and depression (see Chapter Two). These emotional impacts can have cascading effects on place-based relationships and place identity of community members.

As a result of the changes to water observed and identified by community members, many participants in the research appear to be experiencing feelings of loss, in myriad ways. Some people described specific loss of places or of the traits/characteristics that defined those places as special to them. Others felt that their ability to carry out a traditional lifestyle had/had been compromised, and others discussed concerns about how the losses will continue in the future, leaving little opportunity for younger generations (and generations to come) to engage in land- and water-based activities. For some participants, this sense of loss was very explicit, and for other it was more implicit. For some it was very emotional, for others descriptions of changes

and loss were much more matter-of-fact. Feelings of loss can be powerful and are incredibly personal.

This Chapter addresses the second sub-objective associated with Objective Two (see Chapter One). The first section focuses on impacts to place identity from community-identified changes, through impacts to 1) continuity, security and environmental skills; 2) rootedness and sense of belonging; and, 3) self-esteem and self-efficacy. The second section focuses on community members' responses to community-identified changes at individual/household livelihood and collective levels. The results presented in this Chapter are drawn from interviews, a focus group, observations and the youth photography project (see Chapter Three). Interview participants were specifically asked about how changes to water and to place(s) made them feel in an effort to elucidate the impacts to place identity associated with place change (see interview protocol in Appendix H). Participants were also asked about what they do, or want to see done, to better protect water in the area.

## **6.2 Impacts to Place Identity from Changing Water and Changing Place(s)**

Perceptions of changing water conditions are leading to impacts to place(s), impacts to lifestyle and culture and concerns about health for participants. Interviews were coded to identify 'experiences' of loss, which were then coded using place identity constructs to identify impacts to place identity. Understanding the impacts of loss can be mediated through understandings of impacts to place identity. This analysis revealed that people are angry, sad and frustrated at the impacts of community-identified water changes, to their way of life, the places they love, and ultimately, who they feel they are. Impacts to many place identity constructs emerged. In this

section, I focus on those that emerged across the most respondents: loss of continuity (n = 29), loss of security (n = 32 and the focus group), loss of environmental skills (n = 16 and focus group), loss of rootedness (n = 15 and focus group), loss of sense of belonging (n = 17), and loss of self-esteem and self-efficacy (n = 22)<sup>31</sup>. Strongly interrelated constructs are explored together. It is interesting to note that the place identity constructs that emerged most strongly in relation to experiences of loss were primarily those that emerged most strongly with respect to how place identity is manifested in community members' experiences (see Chapter Four).

### ***6.2.1 Impacts to Continuity, Security and Environmental Skills***

Of all the place identity constructs to emerge in relation to experiences of loss, impacts to continuity and security were the most prevalent. Community-identified watershed changes are disrupting the continuity of the places that people love and identify with (see Chapter Five). These feelings of loss of continuity occur because as places change (or are felt to change), they may no longer meet the needs or expectations of people using them. When places are not continuous, they may not provide continuity to place identity (Twigger-Ross & Uzzell, 1996). As such, the potential for a disconnection in place identity, as a result of watershed change in the region, is palpable for community members.

For many people, the places they know and love are still there, but they have been fundamentally altered, or are becoming increasingly difficult to get to (e.g., access issues tied to changing water levels; concerns and fears associated with impacts to the safety of water and country foods). As such they are not continuous, and may impact congruency with place identity.

---

<sup>31</sup>Self-esteem and self-efficacy and treated together as a holistic construct.

Kenneth Delorme (pers. comm., 2011), described feeling sad with all that the community members stand to lose. He explained that community members are losing their way of life, because of the changes that are taking place. He also noted that community members are losing their routes and the places that they pass on the river and in the delta, and perhaps they will have to begin practicing in new places. Elder Angus Beaulieu (pers. comm., 2010) captured these sentiments, in the following statements:

*Yeah it was so nice before. You can go from one channel, you could switch to another channel. There's a lot of channels here [where it] doesn't really show good, but you can zigzag all around, just about all the way from Fort Res and you go up one channel and back to the lake and kind of...you can't do that now.*

*Nothing. All this is nothing! I been around there with skidoo looking at the place, and oh it's just, you know if you didn't see it before, you wouldn't believe it. You know. Because I lived here, so that's how I know the way it used to be. And it's nothing. So that's what the Bennett dam done to us. And what I'm worried about now is well, I've been worrying about it, what a person can do?*

Community members also described the loss of songbirds and frogs, both in town and in the bush. Some participants noted that the birds and frogs are gone from the area, while others indicated they are still around but do not sing like they used to. This was captured in the quotation in Chapter Five from Elder Mary Pierrot (pers. comm., 2011), as well as described by one male Elder (Anonymous, pers. comm., 2011d). Without these animals, the area is quiet and people miss hearing their songs and calls. Describing something as 'missing' from place suggests an experience of loss, in that the missing thing (for example, birds) has been lost from that place. This discussion of loss of birds can denote feelings that places are not 'whole' with parts missing. Additionally, Elder Pete King (pers. comm., 2010) described missing birds singing in the bush, as well as frogs:

*Now a lot of things [are] missing. Like birds. Nine years ago, the birds used to sing...spring coming in. I watch that every year. [That was the] last time I heard a bird sing in around here, around the delta, hunting geese and that, it's gone! They're around, but they won't say nothing. They wouldn't sing or nothing. All the same thing used to be here...all over. I never heard owl for the last I don't know how many years. Used to be millions of them around. And then frogs. Used to hear 'em, holy! Heard 'em all over. Now there's frogs around, seen them all over, nothing! No noise. No nothing. I still, geese and ducks still call, but the birds, small birds, gone. They're there...they're not making no noise, nothing.*

Community member Velma Delorme (pers. comm., 2011) described changes to the community beach and how sad those changes make her feel – the beach is still there and it is useable, but it is not like before:

*Sad [sighs]. Like you know it's so sad to see that it's just like we're running out of water, like you know when you go to the beach it's like our beach is getting so big. Before, we never had... the beach was never that long. Like, that wide. Used to be just a shore like that, used to wash up and go back down, now it's way the hell like yards out. You know, before it was never like that. Before just right there, there's our beach, like little piece. Used to go there and dip our feet in the water. Now we can't. You've got to walk a long ways to touch the water. We never had sandbar like that in our beach. Never. And then you know the sandbar we have now, [it] is like sand. Jen, before when we were young, we used to go down to the beach...you know the sand like little bubbles, I mean like little lumps, that's the way it was, now it's just loose sand. Yeah we used to walk on there, we used to make hopscotch, now we can't make hopscotch on this damn beach...it's too much sand. I tell you... That's the way it used to be. Now it's not like that.*

Land user Ron Beaulieu (pers. comm., 2011) described feeling like he was losing something important to him, because he feels that many of the animals he has previously harvested are no longer safe to eat. As he explained:

*It makes me feel like I'm losing, I eat lot of the wildlife eh? And I can't, gotta watch what I eat, I gotta check them for sicknesses like when I cut them...*

With many of the changes in place-based continuity (as noted in Chapter Five), some places no longer feel safe for people to use, and the landscape is no longer 'legible' in the ways

that is used to be. Community members indicated it is becoming increasingly unsafe to use the land because of the changes that are taking place. These feelings indicate a loss of continuity, particularly as during interviews such discussions were often permeated with anger, frustration and sadness (as noted above; also Participant Observation, Author, 2010-2011). For example, Elder and land user Paul Smith (pers. comm., 2010) explained that the land, water and weather are less predictable than they used to be:

*The way it looks it might just keep changing. Nobody know when or how it's going to stop. Hard to predict anything nowadays and it's not like the olden days. Olden days everything was the same as last year like, and now you look at last year, this year [will] probably be different again....*

DKFN Environment Manager (at time of interview) Patrick Simon (pers. comm., 2010) described the impacts of changing weather and climate change on fall and winter hunting activities. The proper winds, cold weather and snow that are necessary to properly travel on the land are coming later and at less predictable times. Changing weather is affecting the timing of when people can go out on the land and the nature of how they use and read the land. One Elder trapper (Anonymous, pers. comm., 2010b) described how changes in the Taltson River have changed the way people use that area:

*I travelled the rivers, I travel every year you know. I've been out on the lake, travel all over Simpson Islands and down to Reliance and that, you know, in the summer eh? So I see what's going on you know, I know. Even up the river there, you could just tell - you know from where you had your wharf or something - it's way up on [shore] this year holy [laughs], not even in the water eh. I never seen it like that....River's not a fishing river anymore. The fish I guess they changed. I guess when the water gets too low or something. We don't have that Coney run like we used to have, we don't have that big whitefish run, we still get a few. But nothing like before eh. And that's on Taltson, I'm talking about Taltson here.*

Elder and land user Gabriel Lafferty (pers. comm., 2010) also described impacts to ice and how such changes can make it unsafe, even for people who spend a lot of time out on the

land. This is resulting in adaptive strategies, such as alternative modes of travel and waiting longer to go out on the land:

*Yeah, the ice is not as safe now as used to be. Them days we used to get thick ice flowing down, so if it stops you can cross in a couple hours, you can cross the river. But now you got to wait at least a week. And it's only half an inch sometimes when you're crossing. We usually cross now we take a canoe across or take one of those skimmers...pull that and walk across eh? That's how we get across now. Dangerous now. Before all they do was walk with an axe and cut down all the ice to make it smooth because it's so rough. Yeah but there was ice then eh? But we never seen that for years.*

The loss of security, through changes in the legibility of the landscape, is also connected to impacts to environmental skills. Environmental skills are comprised of competence, understanding and control (Proshansky et al., 1983; see also discussion in Chapter Two). Having understanding, competence and control over a place/environment contributes to how a person defines themselves and their self-understanding (Proshansky et al., 1983). When places change (or are perceived to change) the skills necessary to know and use the environment in a certain way, congruent with long-term use, may be rendered ineffective. In Fort Resolution, changes in the watershed are impacting how people use their environment and how safe and secure they feel doing so (as noted above in terms of the discussion of security). For example, Tom Unka (pers. comm., 2010) described how changes are affecting harvesters and trappers in the community.

New hazards are affecting even the most experienced of land-users:

*I know the changes because I talk to the people that travel on the land a lot, the woodcutters, the trappers, the hunters, they're all my friends. So they tell me about some of the changes that are occurring with them and uh, it's not always a very good change. Like sandbars appearing out of nowhere in the middle [of] the Slave River - it's been unheard of. Things like that, that kind of changes – that's not always good change. Because you could damage your equipment or there's a safety element there too. You could hit a log because of that sandbar or something and tip your boat and you know it could be fatal. So there is a danger element that comes along with the changes that are occurring.*



Loss of security is particularly apparent with respect to feelings of mistrust in water. Community members are upset and frustrated that the water they previously trusted and relied upon – water that sustains all life and is inherently powerful (see Chapter Four) – is no longer perceived as safe. In the past – as noted in Chapter Five – people would simply dip their cup; this no longer feels possible for many people. Elder and land user Angus Beaulieu (pers. comm., 2010) described this, and what this means for him:

*You know, before, the lake here and the river, [when] we're thirsty we just...we don't carry bottled water. You know, we just dip a cup of water, we just drink it. Slave River, this lake, inland lakes, sloughs. We just use the snow, and now even scared to make tea with snow water now. 'Cause you never know what's coming down with all the things from the south you know. So, now everybody carries bottled water. When I go around the delta, I go out hunting, I'm always carrying a couple gallons of water for tea. Never. Never have to do that before.*

For community members who feel it is no longer safe to drink water directly from the Slave River or other important community waters, there is palpable sadness and anger. Though the water is still there and available for use, perceptions of fundamental changes to the watershed preclude people from engaging in this once important practice. As such, many people are turning increasingly to store-bought water, which is both frustrating and upsetting, as will be discussed further below, in Section 6.2.2.1.

Even young people are concerned about quality of water. In her photo essay, student Nicole Enge (in the Grade 7-8 class; pers. comm., 2010) talked about concerns related to oils sands chemicals. Her story involved a journalist interviewing a fish, and the fish expressed sadness about chemicals from oil sands killing and mutilating other fish in the water (see Appendix I2). Keenan Hunter (pers. comm., 2010; see Appendix I2) wrote about a monster that

drinks dirty water from the Fort Resolution water truck, which causes the monster to grow bigger. Thus, mistrust is evident in community youth as well.

Security is also related to how able people feel to be themselves in any given environment. As noted in Chapter Four, many participants derived feelings of comfort, peace and perspective from the land and water, and felt like they could be the best version of themselves. For participants, being able to feel capable and healthy in a place is an important part of security related to that place. As places continue to change, and are no longer continuous or secure for individuals, people can lose the comfort and peace associated with these places. If places are lost outright, then opportunity for feeling like one's best self can be lost completely (in relation to that specific place). This can have cascading impacts on self-esteem and self-efficacy, as will be discussed later in this chapter.

While the majority of participants expressed feelings of sadness, a few participants also indicated that the water and aquatic environment are fine. This was also discussed in Chapter Five. For these participants, changes (as observed and experienced by others) were not leading to experiences of loss. Discussions around everything being fine typically centered on fish health, and to a lesser extent water quality, and did not relate to changes in water levels or flow. For example, when asked about whether he felt that the water was safe and clean, one male Elder (Anonymous, pers. comm., 2011c) indicated that he felt the water '*was still clean yet*' in Taltson and that he was not worried about pollution there.

Participants also expressed a sense of concern or sadness about what the future may hold for their children and grandchildren. In Chapter Five, participants discussed their thoughts about what the future may hold for the Slave River and other water bodies. For many of the participants, this was discussed in terms of what the future would be like for their kids and

grandkids. People were deeply concerned that their kids and future generations would not have the same opportunities on the land and water that they did.<sup>32</sup> The outlook for future generations ‘*looks pretty grim*’ (Ron Beaulieu [pers. comm., 2011]), with many feeling that these generations will lose out on what their forbearers had. As one Elder and land user (Anonymous, pers. comm., 2010a) noted, it did not take long for what has happened now to occur, thus implying it may potentially get worse as the years go on. Hope for the future seemed bleak, given the current changes and concerns. Additionally, one Elder trapper (Anonymous, pers. comm., 2010b) captured loss of security as related to mistrust of water: ‘*Maybe another 20 years there be no world here, we’ll be all poisoned, or something’s going to happen. Too many them guys are playing god with earth.*’

One male community member (Anonymous, pers. comm., 2011a) is concerned that in the future it will be the kids who suffer with the decisions made and changes that occurred in the here and now. For people like him, who are older, there is going to be less of an impact. As he explained in the following interview exchange:

*Participant: Well, I think about the young kids, generation now, they’re going to be, they’re the ones that are going to be suffering. In the future, because me, I’m over the hill already and...you know see it happening, but all the pollution and that coming down. But in the future I think with the younger generations going to suffer for that.*

*Jennifer: So it will be a lot harder for them to....*

*Participant: Yes, yeah, I think for them to go out hunting and you know they’re going to have to bring their own water to drink and stuff. Pretty soon you won’t be able to go swimming in the water.*

---

<sup>32</sup> It is also important to note that other socio-economic factors are shifting young people away from land-based and cultural activities. The shift to wage-economy, ramifications of historical traumas (e.g. residential schools, missionizing process, alcohol and substance dependencies, etc.) and increasing global influences on northern communities are influencing the amount of time that young people spend on the land, and their interest in learning traditional skills (Wesche, 2009). However, as this thesis is focused on impacts from changing landscapes and waterscapes, emphasis in this section is on perceptions of how changing conditions may influence future generations.

Land user Rocky Lafferty (pers. comm., 2011) expressed a concern that the Slave River Delta may not exist in the future if the changes keep happening as they are now (please see section 5.3 in Chapter Five):

*Well it looks pretty upsetting from where we are today. The way the water is dropping now, it's, who knows what's in store for it in the next few years. Maybe we won't even have a Slave River Delta anymore. It's only a couple channels that we can utilize down there in the summer.*

In a focus group (Focus Group Participants, pers. comm., 2011), participants indicated that they felt the future looks scary, as evidenced by the following exchange:

*Lena: The future of our children, our grandchildren, you know, are they going to be able to live the way we did? Well, not the same way, but will they ever be able to travel on their water, or...*

*Trudy: Will they have safe water to drink?*

Even young people are concerned about what places will be like in the future. Youth Shania Miersch (pers. comm., 2011), touched on this in her photo essay (see full essay in Appendix II). She also included a photo of straw on the ground near Great Slave Lake. This straw was put down during the annual dog sled races that are held in the community; these races are an important example of traditional activities and bring people together every year (Participant Observation, Author, 2011). If changes, such as warming weather, continue to take place, activities such as dog races may not be possible in the future (Participant Observation, Author, 2011). Shania (pers. comm., 2011) described her concerns:

*These changes make me feel like the world is ending. I begin to wonder what life will be like if this continues on? How will people in the future feel when they realize what life here used to be like? I think that we should try to help this problem be reduced. For the people of our future. They need to live our traditional life that we can live now, I believe that we will be able to let them live their life as we have lived ours.*

*Figure 7: Photo by Shania Miersch (2011)*



As noted in Chapter Four, continuity and security, as constructs, were most strongly linked to the themes of heritage connections with the past, identity and ‘water is life.’ People form place-based relationships based on past experiences, and familial and cultural connections. Changes to these places can disrupt those connections and disconnect people from the past. This notion is supported by community members indicating that they want the system to go back to how it was before. Furthermore, continuity was linked strongly to identity in Chapter Four. Therefore, impacts to continuity related to experiences of loss further reinforce the importance of continuity in supporting identity construction and maintenance (Twigger-Ross & Uzzell, 1996). Finally, when water remains healthy and safe, it continues to support life, linking to the concept of ‘water is life.’ The changes that community members have identified, experienced and perceived, have resulted in a mistrust that water is safe enough to support life. Concerns have also been raised as to whether the water will remain safe and healthy for future generations. The loss of continuity and security can also influence feelings of rootedness and sense of belonging. This will be discussed in the subsequent section.

### ***6.2.2 Impacts to Rootedness and Sense of Belonging***

Rootedness and sense of belonging were the two place identity constructs that emerged most often in relation to how place identity is experienced by people in Fort Resolution. Community-identified exposure-sensitivities are leading to experiences of loss, which are in turn leading to impacts to rootedness and sense of belonging, ultimately impacting people's place identity.

In Chapter Four, heritage and connections to the past were an important aspect of how place identity forms for people in Fort Resolution. A big part of heritage was rootedness and sense of belonging, both to places and to culture and traditions. For example, in a quotation in section 4.2, Darwin Unka (pers. comm., 2011) the importance of undertaking certain activities to keep his culture going, when talking about why he likes being on the land in another quotation in section 4.2. These activities connect him to his culture and his heritage. In a second quotation from Darwin (pers. comm., 2011) in section 4.2, he also described how times have changed and younger generations are no longer connected to the land in the ways that they used to be and learning things his generation was taught. As noted in Chapter Four, heritage and connections to the past provided participants with feelings of rootedness and sense of belonging. With changes to this, these connections to the past could be lost, both for him and for other members of the community, and for future generations. This can result in a loss of rootedness and sense of belonging.

As described in Chapter Five, community members described many changes, and noted that places 'are not the same as they used to be' or that 'it's not like before'. For example, land user Ron Beaulieu (pers. comm., 2011) described how losing access to places he used to travel to with his family has impacted him:

*Ron: Yeah we're limited to some places we can't go out to, like some islands. It's too shallow now...some of our hunting areas, we can't get in there anymore during the summer, only in the winter we can get in there with snow machines uh?*  
*Jennifer: And are these hunting areas [ones that have] been used traditional[ly]?*  
*Ron: Yeah, well my grandfather used to go up there, and my grandparents. Now, just me. I'm there and I bring my kids there, but like at where my cabin is, my grandparents use to have gardens there in the summer. Like I said right, I can't get in there anymore so I can't utilize gardens or anything now eh?*

Tom Unka (pers. comm., 2010) described the heartbreaking impacts of changes in the Slave River on his lifestyle and accessing a place of fundamental importance to him:

*Even though it's not right where we're at, some of the impacts like, for myself, we lived on the river, my wife and I have a beautiful cabin up on the Slave River and when we initially built it, it was inside a little island, beautiful little place. As the years went by, the top end plugged because of the lowering trend and as a result that whole island is now the mainland, so I can't access my cabin any more. So, we gave up on our cabin so it affected my lifestyle that way. I wasn't able. I had to change my life, because I put a lot of effort into that cabin and my trap line and my way of life up there. I gave all of that up, and came to the community and started working here. I'm not the only one, like the people at Horseshoe [lake], there's cabins at Horseshoe that they can't get in. There's cabins, a lot of cabins on the river that are inaccessible and that. So that's one of the almost the foremost impacts from the lowering [of the water].*

Youth Paul Boucher Jr. (pers. comm., 2011) wrote about the importance of learning traditional roots and skills (see Chapter Four). Other youth are also experiencing these impacts. For example, Morgan Unka (pers. comm., 2011) wrote about how she loved keeping traditions, like how to skin a moose, strong. She also discussed how changes are making it harder to go out on the water, and her concerns that in the near future it may not be possible:

*It is a great experience learning the rivers and keeping our tradition strong. When I'm in the bush I like to take photos and try to pay attention to where we are. When I was fifteen I shot my first Moose it was a great experience to see how a Moose is skinned..... The water has dropped in the Great Slave Lake a lot, when you go to other places by boat you have to be careful and watch for sand bars. Also places like where we shot this moose are difficult to get to. We went there this past summer and we had to get out of the boat and push. I thinking [sic] someday we will not be able to go in the boat anymore because of all the sand bar in our water now.*

**Figure 8: 'A Moose Up River', Photo by Morgan Unka (2011)**



Losing access to places where traditional activities take place could potentially limit the opportunities of these young people to learn traditional skills and values, which are important to them. This could potentially disconnect young people from aspects of their heritage, which could impact the feelings of rootedness and sense of belonging that accompany these heritage connections (see Chapter Four).

Feelings of loss of rootedness and sense of belonging are prevalent in relation to concerns about what will happen in the future for the next generation, as described by participants above. People wanting their children and grandchildren to have the same opportunities they did indicates a desire for the next generations to feel rooted to long-standing connections to places. This was also echoed by younger land user Tyler Delorme (pers. comm., 2011), when he described how people have given up going out on the land because of the changes that have taken place. By losing opportunities to go out on the land, people are losing feelings of rootedness and sense of belonging with particular places or activities that previously supported place identity.



Land user Kenneth Delorme (pers. comm., 2011) described feeling sad at losing the routes people used to travel, ‘our rivers’ and the way of life, because channels are being cut off and water levels are dropping in the river. He noted that access to traditional camps, where people used to travel to, is also being cut off, and that people cannot travel to the ‘good’ places anymore. Loss of traditional places is leading to a loss of ‘way of life’ and is impacting the opportunity to feel rooted to these traditional places and the activities that took place in them. As he explained, he is ‘*sad to see what we have to lose*’.

FRMC environmental staff person Tom Unka (pers. comm., 2010) also described how young people are increasing their dependency on store bought food, which he identified as linked to both changes in water levels and social change in the community. As he noted, it was country food that got people out onto the land and connected them with the land. Today, many younger people have less ‘sense of belonging’ to the land than previous generations, as there is increasingly less of a need to utilize the land. As a result of changes in dependency on country food and land-access, young people are less connected or rooted to the past than previous generations:

*Unfortunately a lot of the younger kids are not too...well the way of life changed say in the last 20 years. Not, you know almost coincidentally with the lowering, the changes that were occurring within the rivers. But the people are starting to be more dependent on store bought food, and the kids of course they prefer to eat hamburgers than boiled moose guts or whatever, certain foods that we lived on. So, losing their dependency there... the food brought you to the land always. Always the food, the food is the foremost [laughs]. You know hunting brought you on the land to live out there you had to eat so you hunted and so on you know. You trap because you wanted to have better food and stuff like that or better clothing. So it's always kind of comes back to surviving. The kids are seeing that there's other ways of surviving here. Going to school, and there's a lot of social programs that are helping people better their lives and stuff like that, there's welfare and other programs and stuff like that.*

Community member Lloyd Norn (pers. comm., 2011) described how hard losing country food will be on many people in the community – but especially hard on Elders. In his statement he highlights the value of country foods for people in the community:

*Well, you know it's getting to the point where, if the water levels are dropping anymore because of further developments, it's going to be really hard on the older people that you know grew up on traditional foods... I don't think they're going to subsidize us for any [of that food], they're not going to provide any subsidies for food, you know if we lose this country food. And I know, I know especially the old timers, people that are in their 70s you know, they would rather have the animals and fish versus monetary compensation. You can't eat light bulbs or money. And taking away quality of life that's I don't know, might not be mitigated or replaced. You know, how do you mitigate something like that?*

As noted in Chapter Four (Section 'What the Land Provides') access to country foods was important for development of place identity, and rootedness was the key place identity construct that emerged as a result of this. As such, continuous, long-term access to safe, healthy and plentiful country foods is important for maintaining rootedness, and connections to heritage and identity. Land user Ron Beaulieu (pers. comm., 2011) noted that he 'felt like he was losing' the country foods that were important to him. This was also described in the quotation from land user Rocky Lafferty above (pers. comm., 2011). Continued loss of access to country foods (whether from community-identified environmental changes, or continued shifts in community lifestyle) can serve to effectively reduce the rootedness that many people feel in relation to the land and specific places they travel to.

Impacts to sense of belonging and rootedness can also be seen in the experiences of mistrust of water. Participants described being able to dip their cup in the water in the past, and that this was an important practice. This was linked to multiple place themes presented in Chapter Four. Many indicated above that now, they do not trust the water or feel safe drinking

directly from the river. Given that this is a strong aspect of place identity, the mistrust and concern people feel about the safety of the water can lead to a loss of connection or sense of belonging with that water.

As one male land user (Anonymous, pers. comm., 2011e) noted, for the sake of his grandkids, he just wants everything to go back to what he indicated were the normal conditions from the past – when the water is three feet higher than it is now. Other community members also expressed a desire to see things go back to the way they were. This is reflective of a desire to have places return to a state where they provide a sense of comfort and solace, and of belonging.

Overall, rootedness and sense of belonging are being impacted by community-identified water changes. Changes in rootedness and sense of belonging may ultimately lead to impacts on certain determinants of adaptive capacity, such as social networks, commitment to place and multiple knowledges (particularly with the impacts to rootedness associated with heritage connections). This will be discussed further in Chapter Seven.

### ***6.2.3 Impacts to Self-Esteem and Self-Efficacy***

In Fort Resolution, self-esteem and self-efficacy are critical aspects of place identity, through health and wellbeing dimensions of place identity, as well as other themes. Impacts to these constructs, resulting from a changing watershed, can affect health and wellbeing and overall place identity. In Chapter Four, participants described feelings of freedom in relation to being on the land. These feelings of freedom shape self-esteem and self-efficacy, in that they can shape how people feel about themselves and their ability to accomplish the things they set out to

do. Community-identified changes in the watershed can have the potential to reduce or eliminate those feelings of freedom. For example, AAMP coordinator Diane Giroux (pers. comm., 2010; AAROM coordinator at the time of interview) described the activities important to her now, and the sense of freedom in doing those things. Future changes may preclude those activities and affect how people function on the land:

*And of course, at a fundamental level it's going to be [a question of] how's a person going to function? Right now I enjoy the freedom of being able to go in the boat, travel on the lake and you know be able to, like one of our youth said at that concert, get a cup and scoop water and drink it. At some point there [are] going to be things that are going to change that we may not be able to drink that water.*

As noted in the quotation above from Tom Unka (pers. comm., 2010; see section 6.4.2), younger generations are increasingly moving away from the land and losing the skills that would make them capable land-users. This is also evidenced in the quotation from Darwin Unka in section 4.2 and discussed in the section above (pers. comm., 2011).

Throughout this research, the biggest impact people described, as a result of changing water conditions, was that people no longer feel they can do the things they used to do. For example, in the quotation in section 6.4.1 from Elder and land user Angus Beaulieu, he described carrying water for tea when he travels on the land now, something he never had to do before. This is because of a mistrust in the safety of the water in the river. Diane Giroux (pers. comm., 2010) described how hunters are being affected by decreasing water levels, perceived decline in moose populations and impacts from past fire on the animals, and that during the Fall hunt in 2011, very few people in town were able to get a moose. 'Bagging' a moose is becoming increasingly rare, and this is frustrating for people who have previously relied on moose meat as a dietary staple (Participant Observation, Author, 2009-2011). Turner et al. (2008, p. 1), state

that “The ability to provide for one’s family and fulfill obligations to one’s culture is central to a person’s self-confidence, self-esteem, and feelings of worthiness. When this ability is denied, it can lead to frustration, helplessness, and loss of self-respect that can last an entire lifetime and affect a whole family or community.” Turner et al. (2008) focused on First Nations’ loss of access to place and ability to provide resources (such as wild meats) through historical oppression and decision-making about lands and resources. However, community-identified changes to water can also limit access to place and country foods, and thus have similar effect on self-esteem and worthiness.

It is also becoming increasingly difficult to predict and ‘read’ the land and environmental skills are being impacted. This is resulting in increasing safety issues, as noted above by Elders and land users Paul Smith and Gabriel Lafferty. This can result in people no longer feeling like they have the necessary skills or ability to do the things they want to do when out on the land. This decreases feelings of self-efficacy and reduces overall health and wellbeing. For example, one Elder trapper (Anonymous, pers. comm., 2010b) described how trapping, as a lifestyle, is ‘gone now’, and that there is no money in trapping. As he states, while talking about trapping and hunting, “*the way of life we had before we could never live it now today. It’s gone.*” This is both due to perceived decline in furbearer populations, impacts of climate change on fur viability, as well as a shift to the wage economy. Lawrence Fabien (pers. comm., 2011) noted that hunting and trapping was still healthy in Fort Resolution, but one could not make a living doing it.

### **6.3 Current Adaptation Responses and Strategies**

Given the impacts to place identity associated with community-identified changes to important places, and to the related values of those places, community members are both required and choosing to cope with and address these changes. It is through the responses to change to places people love that we begin to see links between place identity and dimensions of adaptive capacity (to be further discussed in Chapter Seven). The personal, emotional responses to impacts to place and place identity can lead to behavioural responses, ranging from individual to collective action. It is also important to recognize, as noted in Chapter One, that feelings and words can differ from actions, which could potentially influence the degree of action taken. Responses to community-identified changes can occur at individual/household scales or group/collective scales. Both scales, and related responses will be discussed in this section. This section represents current adaptive behaviours and strategies, based on both current and future community-identified exposure-sensitivities.

#### ***6.3.1 Individual/Household Level Livelihood Responses***

As noted in Chapter Two, one scale of response is the individual or household level. It is increasingly being recognized that the individual/household level is an important scale of consideration, including increased attention to the cognitive dimensions of adaptation (e.g., perception of capacity to adapt and for one's actions to have impact/results). It is important to note however, that individual/household responses do not occur in a vacuum – they are embedded within and shaped by social, cultural and institutional structures at multiple scales. Three key individual level response themes emerged during the analysis of data collected: 1)

perceptions of capacity; 2) mistrust of water and choices for coping with this mistrust; and, 3) individual place protective behaviours.

#### 6.3.1.1 Perceptions of Capacity to Deal with Water Change

Though almost all participants discussed water changes, and the impacts to place identity from these changes ranged (see above), differing levels of perceptions of capacity to adapt emerged. Some participants noted feelings of resignation or helplessness to stop the changes. This was noted explicitly by 10 participants, and also discussed in the focus group. As land user Kenneth Delorme (pers. comm., 2010) explained, there is not much that can be done by people in the community, rather they will have to get used to the changes and adapt to it. This sense of ‘what can we do?’, or feeling of resignation, seemed pervasive in the community, both through interviews and from my time living there (Participant Observation, 2010-2011). People often noted that that the changes are coming and they are seen as not being able to be stopped and that future generations will suffer. Some participants noted a sense of resignation when discussing changing water conditions and how impacts are currently, and will continue to, affect members of the community. For example, younger land user Tyler Delorme (pers. comm., 2011) described how many people have ‘given up’ going out on the land because of the changes that are taking place:

*Jennifer: Do a lot of guys your age still go out and spend a lot of time out there?*

*Tyler: No, just a few of us that do it...And I even noticed like now, the older people have sort of gave it all up I guess. There's not much people that I know go out and do whatever I do...like they gave up on hunting and trapping.*

*Jennifer: And why do you think that might be?*

*Tyler: Because of the changes in the land. Changes in the water levels.*

Community member Raymond Giroux (pers. comm., 2011) explained that not much can be done to stop the perceived pollution coming from upstream industrial development, unless industry is shut down:

*All that pollution's coming down the river, and I don't know... why. They can't do much about it I guess, unless they shut that place down, but they can't do that too, they need gas too eh? I don't know what's going to happen...but the water's getting bad anyways.*

Elder Leonard Beaulieu (pers. comm., 2011) also indicated that there was nothing that could be done to stop what was happening, that it is out of the control of community members:

*Everybody is [concerned about pollution in water], you know but there's nothing we could do about it. Something that's done, and it's nothing could ever change it now. It's going for the worse. This pollution...*

*...I know this water's going to hell, and it's nothing we could do about it. It's just nothing. Tar sands could stop, you know? Still! The damage is already done...*

*...well the water's very important you know. And it's too bad there's nothing anybody could do about it. It's the fault of the environment, you know, government, federal government and its environment people.*

This resignation reflects a certain degree of a sense of helplessness or hopelessness in the face of a rapidly changing environment. People feel that they have no control over changes to the places they love, or agency for dealing with changes. This is linked to the place identity constructs of self-esteem and self-efficacy, as discussed above. For some, the changes and impacts to valued place – and subsequently identity – may be so overwhelming as to cause people to shut down or feel powerless to stop them. Indeed, with so much perceived to be happening, people being overwhelmed does not come as much surprise. Conversely, much of the feelings of resignation seem to be tied to feelings of control over resource decision-making choices. Because changes are primarily seen as coming from outside the community, and



impacting places that people love – and places that those responsible for the decisions have no connection to – there are feelings of inequity associated with resource decision-making and the changes being experienced by community members. Enabling conditions appear to play a huge role in people's perception of their capacity to adapt to change or engage in collective activities.

In addition to the quotation above from Elder Leonard Beaulieu, 16 interview participants, as well as participants in the focus group, noted that the government (both federal and territorial) was responsible for doing something, or had the authority. In many cases, people felt the government was not taking appropriate action. This is coupled with the fact that most people, as noted in Chapter Five, linked the community-identified changes to drivers from outside the community (e.g., Alberta oil and gas, mining, etc.). As community member Catherine Boucher (pers. comm., 2011) stated: *'the government should take care of everything. [The government's] the one that's ruining our lands.'* This denotes a sense that many of the community-identified changes are not caused by community members, but rather coming from forces outside of the community and that external forces have both authority and responsibility to do something. Other than a small handful of people, few community members identified the community (or community members) itself as a key cause or driver of the discussed changes (with exception of impacts from the sewage lagoon noted in Chapter Five, and two participants who noted cleaning up garbage on the land, as will be discussed below). Thus, there are feelings that it is not solely the community who should be responsible to 'fix' the problem. Rather, many feel the problem should not be happening in the first place. This is tied strongly to the above notion of resignation.

Participants identified a 'David and Goliath' type of situation – where they felt there was little individuals or the community could do to stop the change that is seen as linked to rich,

powerful forces in industry and government (as noted in Chapter Six). For example, as Elder and land user Lawrence Fabien (pers. comm., 2011) stated:

*I could be here all day trying to explain to you... what should be fixed [laughs] and what should be done, but you know, if the government doesn't agree with us... we're never going to go anywhere.*

Elder and land user Angus Beaulieu (pers. comm., 2010) also expressed feelings of frustration of not being listened to and feeling like there is nothing that can be done. He related these observations to the experience in Fort Chipewyan (see Chapter Four), where people have been fighting for a long time for action and change:

*So I don't know what a person really can do, but they have to, that Fort McMurray thing there, look at all their ducks and things, you know, such a big outfit that they wouldn't listen to anybody. I mean Fort Chipewyan have been talking about it, and everything that's from there all goes through here you know. So there's, I don't know why Fort Chipewyan can do nothing, can't seem to do anything, they talk a lot about it in there and everything, and they're just getting nowhere. So I don't know what a person really can do...*

Elder and land user Henry McKay (pers. comm., 2010) expressed feeling a great deal of anger towards industry and other responsible parties, who do not seem to see downstream residents as human beings, given that potentially harmful activities are allowed to continue. This quotation provides an overall picture of how loss of trust in water can impact people in communities that may be affected by upstream development. As Henry noted:

*We are important. Because we're people. We're not a bunch of dogs or just animals sitting out here. We're human beings. And we want to live too. You know. Yeah you need all those things, but talk about people's lives! Without water we're dead! Like I said, I'll put it that way, I don't care...Even the snow I'm scared to melt it, that's water. I used to just eat it before but I won't do it anymore. Even it falls on my mouth I want to spit it out right away. That's how I feel about it.*

As Elder Lena McKay (pers. comm., 2010) also explained:

*The government doesn't care that the water is you know, how it's affecting us people here. Just because of the royalties they get I guess.*

As evident above, for many people (though as is important to note, not all people in the community agree), these feelings of resignation seem to reflect issues of equity and control of resources decision-making outside the community. People with different values and different motives – in places far removed from the felt impacts of change – are making decisions that threaten and change the places that people love and value, and that are a source of identity. Thus the ability of people to act to protect places they love, can in some instances be shaped by institutional, economic and cultural forces operating at broader scales. This, however, does not negate the importance of understanding individual and community agency, and how this is shaped by place identity and influences ability to deal with change. Issues of equity and scale, and the importance of individual and community agency within broader processes will be addressed further in Chapter Seven.

Five participants, including land user Kenneth Delorme above (pers. comm., 2011) explicitly talked about how the need for community members to adapt, that there is no other way. For example, male Elder participant Ernest Beaulieu (pers. comm., 2011) described the importance of adapting to changes, and of everyone taking responsibility for water stewardship (whether in the community or beyond):

*We have to adapt...we can't blame people...if we don't adapt then we'll never survive...*

*...The water source. You have to protect the source. We - it's not who – it's all our responsibility. No matter where we are.*

This statement reflects the importance of protecting the source, or the water that provides life to all parts of the environment, including people. This is congruent with the importance of ‘water is life’ as a valued component of place identity, as identified in Chapter Four.

Patrick Simon (pers. comm., 2010), DKFN Environment Manager (at time of interview), echoed this, when asked about what he thought if the changes continued and the delta dried up:

*That'd be horrible, it'll probably kill our spirit and we'll have to adapt as best we can but, we'd certainly be disappointed in Canada because we can't see them doing it but, it would bother us a lot. But we're an old people so we'd adapt, we'd survive, somehow, someway.*

Community member Ronald McKay (pers. comm., 2011) talked about how the Aboriginal peoples of the North are resilient, and are the only people who will be able to truly adapt to environmental change. As he stated:

*For me, [laughs], I don't feel scared or anything, I don't feel a fear. I know that we're the only people in the world that can adapt to any changes, really dramatic changes to our lands or...the way we live.*

There is also opportunity to use these concerns, community-identified changes and related impacts to place identity to galvanize people in the community to act against these impacts to protect the water for future generations. A few participants explicitly indicated that action had to be taken to do something about the changes and that people need to work together in the community, and with partners, to protect the water and the places they love, both now and into the future. This represents feelings of capacity, in that people working together are seen as being able to accomplish something towards water stewardship. This commitment to place or desire to take action could potentially influence adaptive action (see Chapter Seven). As older community member Raymond Simon stated (pers. comm., 2011):

*Well, you know like I said, the water keeps dropping, pretty soon you're going to drive over there, you're not going to go over there by boat. We can't uh, we can't let that happen. Has to be stopped somewhere, you know, otherwise the generation that's coming up won't be able to use that water.*

Land user Warren Delorme (pers. comm., 2011) also expressed the need to do something, and that people in the community need to start working together to do this, because it is now or never:

*Oh if they don't try to fix it now, it's doesn't look too good for them in the future. We got to start working on our issues, start working together, if that don't happen then there's no future in that area for them.*

Catherine Boucher and Leandre Beaulieu (pers. comm., 2011) discussed the importance of putting the political aside, and having multiple groups come together to deal with watershed change (as will also be discussed further below):

*Leandre: Yeah, [we need] a kind of watch dog or committee or I don't know what they call it. But it would have to work with other First Nations communit[ies] up the Slave River, it's got to be like...*

*Catherine: A partnership.*

*Leandre: Like [at the] band level or what you call it.*

*Catherine: Band, Métis level... they got to work together. Work together to get things done. Only way. Then things happen. And if we keep talking about it, nothing's going to happen. Like you know...*

*Jennifer: Can't just keep talking, there's got to be some action?*

*Catherine: Got to be some action done... Working for people, not oil or whatever. I mean what's more important, people or money? Nowadays, money is more important than people. When we never used to have money before.*

Others are engaging in action at individual and collective levels, as will be discussed below. Participating in behaviours to protect water or place denotes a degree of self-efficacy, in that people engage in actions because they feel they will affect change (as will be discussed in Chapter Seven). These additional behavioural responses will be detailed in the subsequent

sections. The role of self-efficacy in shaping future adaptive capacity will be discussed further in Chapter Seven.

Perceptions of capacity and ability to affect change appear to be influencing the choices community members are making about adaptation to water change. Some participants feel a sense of resignation, which is often linked to feelings of equity and control over decision-making. Some community members noted that responsibility to fix the problem rests with outsiders. Others are galvanized to do something and to work with members of their community to protect the water. All of these responses display feelings of capacity or agency to adapt to change, and are tied with feelings of self-efficacy and self-esteem. However, these feelings of agency at an individual or household level are also embedded within social, cultural and institutional structures at higher scales, as evident by the feeling of lack of control and equity. At an individual level, people may feel that places they love are being impacted and they may want to do something about it, but they may feel unable to exercise agency or power over the situation. This is where collective action – based on collective values and shared identity – can become important (as will be discussed further below). Multiple people fighting for the same issue can become more powerful than one person's actions alone. However, this is not to say personal agency is not important. People have to feel willing and capable of participating in groups processes (as will be discussed in Chapter Seven). Furthermore, as will be discussed in Section 6.2.1.3 below, some individuals are taking stewardship into their own hands and engaging in actions to protect place at an individual level.

### 6.3.1.2 Mistrust of Water and Related Behavioural Responses

As noted above, one of the key reactions or experiences with community-identified changes was a pervasive mistrust of the safety and quality of drinking water. This has generally led to two interrelated responses: not drinking water on the land and carrying water when travelling. As noted in Chapter Five, and above, many people said they would no longer drink the water from the lakes or rivers or out on the land. Some outright refuse; some will do so only if it boiled. Additionally, some community members will not drink water from their taps. This represents a reactive coping mechanism, as this is not something that people necessarily want to do, but feel they have to do in order to stay safe and healthy.

As noted in Chapter Five, some people indicated that they no longer drink the water from the Slave River or other tributaries in and around the Slave River watershed. Warren Delorme (pers. comm., 2011) indicated he did not know how the water tastes, because he refuses to drink it because of concerns about safety: *'It's not clean. It's dirty, I don't know how it taste, 'cause I don't drink that water.'* Some community members will only drink the water if it is boiled first – contrasted with the past practice of simply dipping a cup into the water, which was special to many people (see also Chapter Five). As land user Arthur Beck (pers. comm., 2011) explained:

*We don't drink water from Slave River anymore...No. You don't even, even boiling it's no good, because chemicals coming from the south. So boiling it's no good. I mean if it was just bacteria and parasites, we can boil it. But this is something else.*

At least 10 participants said that now, when they travel on the land, they carry water with them, and some indicated this was what the majority of community members do now. This was something that never had to be done before. For example, as land user Darwin Unka (pers. comm., 2011) explained:

*Even now, when I go up that Slave River now, I bring five gallons of water, my own water....I wouldn't trust that water.*

This is an adaptive strategy to the community-identified concerns about change in water quality. People do not want to stop going out on the land or doing activities that are important for their identity and well-being. However, in order to do so, they must change the way they travel and access water.

As noted in section 6.2, this mistrust of water is contributing to loss of security and continuity, which are important aspects of place identity for community members. Continuity and security were important for the place-value themes heritage, identity and 'water is life'. For a community that relies on water and draws their identity from the water and the things that rely upon it, not being able to trust that water on the land or in the community is safe can be devastating. Though it seems at present that there is limited impact related to human activities on source water (see Chapter Five), the perception of unsafe water, and of changing look, taste and colour persists. This is resulting in people changing the ways that they use and consume water.

#### 6.3.1.3 Individual Place Protective Behaviours

Eight interview participants, as well as participants from the focus group, talked about taking individual actions to protect the places that matter to them or that people had responsibility to take care of the land. These actions of stewardship reflect a desire to keep places continuous and in the same state that people have come to identify with. As noted above, and in Chapter Four, continuity is important for place identity. People want places to remain congruous with the values and meanings they assign to them, which in turn maintains congruence with identity. The individual actions people are taking reflect a desire to maintain the continuity of



places, which in turn serves to maintain feelings of rootedness and sense of belonging, security, self-efficacy and functions of environmental skills.

Place protective behaviours can range from picking up garbage out on the land to selectively harvesting animals to keep populations healthy. For example, community member Raymond Simon (pers. comm., 2011) talked about picking up garbage on the land, and how easy it was. This seemingly small activity goes a long way towards keeping places he wants to return to clean:

*There are some people you know, if you go places over there, there's garbage here, garbage there, you know. I mean I used to do that too in the very beginning, last ten years, then I realized I'm going to come back here again, and now I started hauling my garbage back. It's not hard to haul garbage back.*

One male land user (Anonymous, pers. comm., 2011e) indicated that people in the community need to stop killing cow moose and calves to protect the populations. He also told me about how he keeps track of the different types of fish he is catching, to document changes in the composition of species. Raymond Giroux (pers. comm., 2011) also talked about the importance of selective harvesting, and leaving cows and calves, especially in light of the community-identified decline in moose populations. Community member Wilfred Beaulieu (pers. comm., 2011) described keeping track of news on caribou in a scrapbook, and how he intends to do his own study and research on what is happening to caribou. The purpose of this is to share this information with his leadership to make them aware of changes taking place. Furthermore, community member Lloyd Norn (pers. comm., 2011) described what drives him to engage in stewardship and advocating for the protection of water:

*To me it's the most important commodity that my people have. And it's also a spiritual thing... Because... native people under Treaty 8, we all have a moral duty to protect this valuable resource for future generations. And uh, I'm going to do the best job I could. Whether it's political, backing up [co-worker at the*

*water treatment plant], I'm going to be duly diligent about this whole matter. And I know there's a lot of people in this community that do care about the water.*

Place protective behaviours can also have collective dimensions. As will be discussed in the subsequent sections, community members are also working together to jointly engage in activities designed to protect water and specific places and bring awareness to the changes that are threatening their livelihoods and their identities. It is also important to note, that in many cases, these individual actions (whether intentional or not) fit into broader collective actions processes taking place. For example, one participant's (Anonymous, pers. comm., 2011e) notes on fish species could inform community-monitoring or research on aquatic ecosystem health, while Wilfred's proposed study could help inform environmental decision-making and action related to caribou.

### **6.3.2 Collective Responses**

A number of community members discussed the need for joint action to deal with impacts to water, and to protect the places they care about and identify with. Some members of the community are currently actively engaged in collective processes of water stewardship, ranging from monitoring to research to environmental working groups. This section will discuss two areas of collective responses: collaborative action (including building a community voice, networks, formal partnerships and research and monitoring programs) and (re)connecting people to the land and passing on traditional values and skills to younger generations. As noted above, participation in action denotes a degree of self-efficacy; in this case self-efficacy contributes to broader collective processes. People participate in collective action because they feel that doing

so could potentially effect change and that actions will have outcomes. Thus, collective action represents a form of place-protective behaviours manifested at a group level.

#### 6.3.2.1 Collaborative Action

Collaborative action, as part of collective responses, is defined for the purposes of this dissertation, as two or more people working together around a particular issue. This is consistent with definitions of collaboration elsewhere (see for example, the seminal work by Gray, 1989). Working together can be defined as information sharing, formal or informal group processes, or joint implementation of activities. In Fort Resolution, four areas emerged as part of collaborative action: informal community information sharing networks; participation in multi-stakeholder processes; collaboration with external partners for research and monitoring; and, building a jointly shared community voice.

Networks and relationships between groups in the community, based on common experiences and activities, such as trapper groups, strengthen ties between people in the community, reflecting examples of bridging ties. These relationships draw from formalized structures, such as processes occurring through the Slave River and Delta Partnership (SRDP), or informally, through relationships between people in town who share common interests. FRMC environmental staff person Tom Unka (pers. comm., 2010) described both past and present groups that talked about water-related issues:

*We used to have these little committees, environment committees and it [was] comprised of people like from the hunters and trappers association, the environmental oriented people. We have a little group of hunters, trappers and we'd usually meet 3, 4, 5 times a year and we identified some of the changes that are occurring, and trying to meet some of the changes by way of maybe helping this trapper a little more because he lost his cabin and stuff like that, that immediate little problems we dealt with. Of course, but this committee being the*

*land users they always talked about the lowering water, it's always the biggest concern was the water.*

One Elder trapper (Anonymous, pers. comm., 2010b) also described the informal networks in the community, and how people come together and talk about the changes they are observing:

*It shows, you know, pretty well everybody knows that in this town, like when we get together, we talk about things like that eh? You know. That we're losing lots you know. The water.*

These groups (whether formal or informal) come together and form a network of people with similar interests and values, based on way of life and importance of the land in their daily lives.

As noted earlier in this Chapter (see section 6.2.1.1), people in the community expressed the need for community members to work together and to put the political aside. Collective action is seen as an important step forward for protecting the water that shapes community identity, and the places that are fundamentally important for who people are. There is a sense that protecting the water is everybody's responsibility, regardless of age, level of land use or political affiliation. It appears as though community members recognize that there are underlying shared values – and indeed, a shared identity that coalesces around these values – across groups in the community.

Community-based monitoring activities, both within the community and with multiple partners, are a way of connecting with partners and forming networks that lead to information sharing and long-term collaboration. This creates excitement for and commitment to these activities, sustaining momentum over the longer-term. Both community Aboriginal governments have environmental stewardship and monitoring programs that they run. The SRDP is a good example of a collective action process, in which community members participate. People engaged in such activities feel they have capacity to address water changes, through research and

monitoring. Members of this group are working towards monitoring and research that can support watershed decision-making (Participant Observation, Author, 2011-2013).

Understanding the changes that are taking place through monitoring can also identify where and when – and what types – of adaptations are needed to deal with ongoing changes to water. The SRDP was formed in 2010 as a response to observed watershed changes on the Slave River and in the Slave River Delta (Participant Observation, Author, 2011-2013). The SRDP is comprised of Aboriginal groups for Fort Resolution and Fort Smith (including DKFN and the FRMC in Fort Resolution), as well as municipal, territorial and Federal government agencies and academic partners. Participants raised concerns about declining water levels, concerns about water quality and impacts to fish and wildlife. In addition, participants discussed the importance of building community capacity for engagement in research and monitoring. The SRDP has identified key aquatic ecosystem health indicators from both Traditional Knowledge and Western science perspectives, and prioritized these indicators for research and monitoring.

The group coalesces around the value of the Slave River and Delta, and the importance of understanding what is happening to places people use, love and depend upon. The goal of the SRPD is to engage in research and monitoring activities – focusing on important places and ecologically and culturally critical aquatic ecosystem components – that can feed into decision-making processes at multiple levels. A few members of each of DKFN and FRMC sit on the SRDP as the main representatives, and additional community members (e.g., Elders, land users, youth) participate in knowledge-sharing, direction-setting and monitoring and research activities. The SRDP is a key example of a collective process currently occurring within Fort Resolution. However, as noted in Chapter One, words and feelings of SRDP participants do not always translate into action on the ground. This disconnect between strongly expressing values and

desire for action at the table to action on the ground, represents an interesting avenue for future research.

Furthermore, members of the community play various roles in other collective movements or partnerships with the ultimate goal of healthy and clean water, both for now and into the future. Examples include the Peace-Athabasca Delta Ecological Monitoring Program, Akaitcho's AAMP monitoring program, and the Tu Cho Water Conference, among others (Bianchi, 2006; AANDC/GNWT, 2012).

It is important to note however, that participation (or desire to participate) in collective action processes, whether formally or informally, is not predicated on love of place or identity alone. Though, as it appears above, and throughout this dissertation, that value of place is a strong motivator for people to engage, other enabling factors can also shape the level and type of engagement – or outcomes of that engagement. Lack of resources, influences of enabling or constraining institutions (such as social dynamics, government/political will, etc.) also contribute to ability to engage collectively and achieve goals. As noted above in the quotation from Tom Unka (pers. comm., 2010), environment committees used to exist in the community, but no longer do.

Collaboration with external partners was also cited as important for protecting water and important places. External partners, whether government, academic or other, can provide additional resources, support and expertise to develop stewardship activities or provide information about the perceived impacts (such as those noted in Chapter Five). DKFN Environment Manager Patrick Simon (pers. comm., 2010) described the importance of working with people who care about the land and water, and forming partnerships with outsiders when

necessary. This can draw on strengths of multiple people with multiple perspectives to tackle challenging problems, building a diverse partner network:

*I think we've, we've always tried to encourage, because we don't have the expertise or the technology or even the money, we utilize what everybody in the world utilizes in these situations, we utilize the schools and the governments and the relationships that we have. So we utilize first and foremost our Treaty and then our relationships with the people who either want to partnership or work with us or the ones that that's their job and that's why they work for Canada they do it for all Canadians as well....*

*...So we make sure to work with people that we feel you know that are really honest about and you know have conviction about [what] they do in terms of their job, and in terms of how they want to work with us, so we make sure that we get the good sides as the way that the science brings it, because we want to know even if it's things we may not like to hear, we still want to hear it.*

FRMC environmental resource staff person Tom Unka (pers. comm., 2010) talked about the importance of trust and working with 'good' people:

*Community-based monitoring is kind of an avenue for us to retain some of that information that we couldn't retain before. You know what I'm saying? So it is, it's an avenue to access some of the historical data and, it's also kind of like a platform that we can work on now, because it's a group of us, and when you're in numbers, there's strength in numbers, so we have some credible people there, we have people like [federal scientist], these people are credible people, [territorial employee], all these different groups of people I've worked with in the past, they're all come to the table again. And we had a great time talking about some of the stuff that we could be doing, in regards to assessing the water quality and quantities on Slave River and I'm excited about it. Very, very much so.*

Drawing from these statements, it also becomes clear that the establishment of long-term networks and partnerships also increases the level of trust, further reinforcing collaboration among multi-party activities and strengthening adaptive capacity. This will be discussed further in Chapter Seven.

Linking or bridging multiple knowledge between partners was raised by land user Arthur Beck (pers. comm., 2011). He described the importance of Traditional Knowledge in

understanding watershed change in the region, and how Traditional Knowledge and Western science can work together:

*They're [the government of Canada] looking at it too shallow, they're looking at the scientific knowledge instead of Traditional Knowledge, that's the problem with Canada. And they don't know Traditional Knowledge because you don't learn it in school. Traditional Knowledge is passed down from generation to generation in the way of life, the way we live. Practice it. I could sit down with any scientist and I can rattle off with scientists and by the end of the day we can work together. I can tell him the problem, he can tell me the details of what chemicals are in there and stuff, and that's all he can do. I can tell him the problem, I can tell him why, and I can tell him how to fix it. So as soon as they start working TK in with scientific knowledge they're better off, and [it is] cheaper and [less] time consuming. Right now what science is, we've been living here for thousands of years, hundreds of years, we know everything here...all the animals, we watch the animals because we study them, we live off them so we gotta know what they do. And we do know. While scientists come in and they study but they'll come back three years later to study again next year, three years, by [that] time the damage is there. We know there's problem, by the time the scientists say oh okay it's ready, it's too late.*

Participants also noted the challenge of collaboration with external partners, particularly with respect to information sharing. In terms of place identity, having access to information can inform and shape feelings of security and continuity (important for identity salience and congruence), which may contribute to people continuing to use a place or feel safe drinking water from that place or hunting animals in that place. Information may also reveal new things that need to be assimilated into existing place meanings, or may (re)shape how people interact with and feel about a place. When people are concerned or mistrustful of their water, they want to know what is happening. Lack of information sharing can reinforce feelings of mistrust in the quality of the water and being scared about what is happening, as without information it can be hard to know what is truly taking place. Community member and land user Darwin Unka (pers. comm., 2011) explained this at two points during his interview:



*We have a lot of studies and that into water quality and finding out what's in the water, and stuff like that. And we never get an answer back you know, we can cry all we want and talk about it, but you guys do all the studies and we never, ever get the answer back of what's in our water....*

*It's always hush hush, you know. Don't tell them what's in water you know. It's sad. Sad but true. We need to get it to the people. We want to find out what's in our water. You know. I'm even scared to have a cup of coffee some morning[s]. I never know what's in the water.*

Community member Trudy King (2011) echoed these concerns:

*I know like on the Slave River through the years like even from the 80s, late 70s early 80s, there's been a lot of university students studying the water and the fish and everything on the Slave River but [sigh] we never ever get any reports, so we don't even know what they're finding, and what they've been finding in there all these years. It would be nice to.*

This to a certain extent highlights differing values between community insiders and outsiders – it may seem to community members that people not from Fort Resolution do not have the same emotional attachment to the findings or results, or have differing motives for undertaking work, if information does not reach people in a seemingly timely manner. As noted in the quotation above from DKFN environment manager (at time of interview) Patrick Simon, the community wants to work with people who share their convictions and values. The importance of information, and shared values, will be discussed further in Chapter Seven.

Seven participants also discussed the importance of building a collective voice and advocating for the protection of water, as did participants in the focus group. Advocating for place, and developing a common voice represents a particular type of place-protective behaviour. It also represents a key form of collective action, where people come together to accomplish a particular goal. While people did not comment directly on this stemming from a shared sense of identity or values, based on the analysis of data, it is clear that participating in a collective

building of voice draws strongly on the common thread of loving and wanting to protect water. In the focus group (pers. comm., 2011), participants expressed wanting to be able to voice their concerns, and meet with government and MLAs to lobby for water. It was also identified that people want a water conference that could bring people together to sit down and talk about these issues collectively.

Community member Raymond Simon (pers. comm., 2011) described that it was important to let people (primarily industry) know what they are doing to the water, and for him, this was important because he did not want to stop going to the places that mattered to him:

*We're downstream and we look after our end of the water, and we have to let those people know upstream that, you know, if you guys spoil our water then you're also making it hard for us to look after our own water. You know? If the government keeps letting this happen, pretty soon, they're going to be crying for water just like the United States, you know? Things don't last forever. We hope it does, but you know. I hate to quit going over there [places he travels to], you know, I want to keep going there as much as I can, and teaching it, teaching the children and the grandchildren how to go over there, you know. But in order to do that, we need the water yet.*

This statement reflects a love of key places, and wanting to protect them, as well as the valuation of future livelihoods and considering these in decision-making.

Building a voice, based on collective values for water, does not have to be limited to within the confines of the geographical community. Indeed, as evidenced in Chapter Four, people in Fort Resolution identify strongly with other communities experiencing similar watershed challenges, most notably the Alberta community of Fort Chipewyan. These common struggles, and common values about importance of water can create a powerful opportunity for groups within these communities (and others) to come together and advocate for the protection of water. For example, as DKFN Environment Manager (at time of interview) Patrick Simon (pers. comm., 2010) explained the importance of connecting groups together:

*Right now, we just talked with just the Fort Chip [people] right, but eventually...we want to tie it all the way into every delta from the mountains to the Arctic Ocean. We also want to make sure that the people all around are sort of working [together], and that's why we have these different councils and stuff that come together, that speak around the pole right.*

Development of and participation in a collective group can further reinforce those shared values, shared identity and sense of belonging to a group (Polletta & Jasper, 2001).

Some participants also noted that though building a voice is important, in many cases they feel like the voice they have currently is not heard, whether by leadership in the community, or by government or industry. A few participants explained that they feel like they have no say in watershed decision-making at the community level, or that when information is brought forward it feels as though information goes in one ear and out the other. There are perceptions and concerns about not being properly consulted on water issues, or that leadership in the community was not speaking out about things impacting the waters in and around the community. Some participants also expressed concern that 'money talks.' This was a discussion that emerged during a focus group (Focus Group Participants, pers. comm., 2011), and was related to industry and government being influenced by money, resulting in not listening to community concerns. This ties into feelings of resignation, discussed above, as reflected in the earlier quotation from Elder and land user Henry McKay (see section 6.2.1.1).

#### 6.3.2.2 Connecting People to Water: Passing on Traditional Values, Skills and Knowledge

Connecting people to the water and land, and passing on traditional values and skills also represents a form of place-protective behaviours. In Chapter Four, participants discussed how connections to heritage and the past were part of why they valued places, and resulted in feelings of rootedness and sense of belonging. Connecting people to the water and land, and providing

opportunities to pass on traditional values and skills, contributes to building/fostering rootedness and sense of belonging, as well as ensuring continuity of traditions and values.

As Wilfred Beaulieu (pers. comm., 2011) noted, to best protect the land, people need to look at how Aboriginal peoples dealt with things in the past:

*If they need development they should look at how the native people took care of the land you know? Cause they're [the] first [people] here, we had no doctors... we were forced to do everything ourselves and any broken bones, cuts, babies stuff like that, we had to do all those things ourselves and we had to learn it ourselves.*

As noted in Chapters Four and Six, Traditional and local knowledge sharing is a critical piece of place identity for many people, through the spaces, places and networks this sharing takes place. Heritage and connections to culture are fundamental for why many people identify strongly with certain places. Some participants talked about the importance of passing on Traditional Knowledge, values and skills to younger generations. This can serve to help protect valued places. For example, one male Elder (Anonymous, pers. comm., 2011c) described the importance of this and how young people would probably enjoy learning traditional skills:

*I used to take some kids out sometimes, by boat. They should do that often. You know take a culture camp or something, [take] the kids, can show them bush life eh? How to set traps for rats, beavers. [The kids would] probably enjoy it.*

One Elder trapper (Lawrence Fabien, pers. comm., 2011) noted that a lot of kids were still engaged in trapping, as were others in the community (though it is very difficult to make a living doing it). He also noted that Fort Resolution was doing well compared to other communities, where trapping is almost gone. Focus group participants described the importance of young people learning traditional values and to make sure they 'understand while they're younger' (Focus Group Participants, pers. comm., 2011). Focus group participants stressed that it

is important to teach young people on the land and water, through activities like hunting and culture camps. Teaching people about the land and water can help to instill strong values, and for ultimately protecting places over the long term – an important adaptive strategy. As Raymond Simon (pers. comm., 2011) explained:

*If I'm doing that [taking care of the water] and everybody else should be doing that, but the only way they're going to know, is someone has to teach them, eh? You know like, it's been there for forever, and I guess the people that used it before me looked after it, so I just, I want to be able to look after it when I use it and teach other people that come out there with me, how to care for it you know. So it's there for the future, for the kids that are coming.*

In Section 4.2 in Chapter Four, participants noted that engaging in traditional activities is important for the vitality of the culture (see for example quotations from a male community member [Anonymous, pers. comm., 2011a] and Darwin Unka [pers. comm., 2011]), which is tied to the land and water. Passing on cultural values and skills can contribute to this continuity (see quotation from community member Velma Delorme [pers. comm., 2011]). For example, youth participant Paul Boucher Jr. (pers. comm., 2011) wrote about how important learning traditional routes was to him.

Appropriate skills to use the land, and comfort in doing so, is reflective of environmental mastery and skills, an important component of place identity. Learning appropriate skills prepares people for activities on the land and for dealing with potential change. As Elder and land user Ernest Beaulieu (pers. comm., 2011) explained, when asked about how he used to take people out on the land:

*Well some people, some of them like to go out, but they've got to be prepared. Some are not prepared, they're unaware of the dangers. Not only on the land, but from the participant.*

People have to have the skills to be knowledgeable and feel comfortable using the land, so it is important to pass these skills on. Having the right mix of skills can help people to recognize and adapt to changes, and can contribute to self-esteem and efficacy, potentially influencing feelings of capacity to adapt (as described above). Having the appropriate skills can also contribute to feelings of security in using the water and land, further reinforcing connections to place and ultimately place identity. As noted in Chapter Six, changes are making it harder for people to feel safe and comfortable on the land, and resulting in impacts to place identity. As places continue to change, the skills needed to use the land are required to change in concert, which can be frustrating for land-users (see for example, Section 6.2.1.1).

This desire to pass on skills, and to engage learning processes, can be reflective of a rootedness to heritage and a sense of belonging that comes from enacting traditional skills and values on the land. Participants identified values for what places should look like and how these places should be used (continuity). These values emerged from past experiences and from cultural teachings. By instilling traditional values in younger generations, participants are imparting opportunities for younger generations to feel rooted and that they belong in place, while also cementing core values for land and water stewardship, contributing to ongoing protection and continuity of important places, which in turn contributes to ongoing production and maintenance of place identity. Place identity is maintained because the character and function, as well as continuity and distinctiveness as defined through social and cultural constructions of those places, are maintained through proper use as defined by traditional values. Ongoing connection to tradition and heritage can also serve to strengthen and maintain identity processes through relationships to place(s). Thus, feelings of rootedness and sense of belonging,

as expressed through attachment and valuing of heritage connections to place(s), both shape determinants of adaptive capacity and are simultaneously shaped by these determinants.

Loss of places, or functions or attributes of places, can also potentially impact knowledge transmission and learning. Community member and land user Ron Beaulieu (pers. comm., 2011) described how it is important to him to take his children out on the land to pass on traditional skills. Increasingly however, he is having difficulty accessing important places (like his cabin).

As he states:

*Well to try to pass on the knowledge to the kids uh? Yeah. Well I got a cabin up on the Slave River about 22 miles from here too. But in the last couple years I haven't been able to make it in to my cabin. The water level has dropped so much uh? Dropped about a meter and a half. I only could get in there in the wintertime now. I can't get in there with a boat no more.*

Passing on knowledge and skills to younger generations, and reconnecting people to the land, is seen as an adaptive strategy to promote traditional values and stewardship. This in turn promotes continuity of place through properly perceived use, value and care. Connecting people to the land and teaching skills promotes opportunities for connections to heritage, and thus feelings of rootedness and sense of belonging. It also promotes environmental skills, a core component of place identity, which can in turn make people feel comfortable and capable of being on the land and/or addressing changes (self-esteem, self-efficacy and perceptions of capacity). As community-identified place changes are impacting aspects of place identity, passing on skills and cultural values is seen as ever more important for maintaining identity (both place-based and cultural). Loss of places can potentially disrupt this opportunity to pass on knowledge. The importance of knowledge for adaptive capacity, will be discussed further in Chapter Seven.

### **6.3 Chapter Conclusion**

Community members in Fort Resolution are experiencing profound impacts to place identity associated with changing places, including impacts to continuity, security, environmental skills, rootedness, sense of belonging, and self-esteem and self-efficacy. As a result, community members are responding to identified changes to loved places and place identity, with a number of different coping mechanisms and adaptive strategies. In these adaptive strategies, we begin to see how place identity shapes (in concert with other factors) the choice of strategy, the importance of that strategy, and how they are implemented. This thus points to a connection between place identity and adaptation. In the next Chapter, I will discuss the nuances of the connections between place identity and adaptation and future adaptive capacity.



# CHAPTER 7: DISCUSSION - THE RELATIONSHIP BETWEEN PLACE IDENTITY, WATER CHANGE, ADAPTATION AND ADAPTIVE CAPACITY

## 7.1 Introduction

As O'Brien and Wolf (2011, p. 233) note, "what is considered legitimate and successful adaptation depends on what people perceive to be worth preserving and achieving, including their culture and identity." A values-based approach to adaptation assessment seeks to make explicit the subjective and qualitative dimensions of climate change and the things that are intrinsically desirable or valuable to people (O'Brien & Wolf, 2010). These qualitative dimensions are the things that matter to people and groups – such as places and the experiences that places can provide. The importance of preserving and protecting these places for present and future generations, in order to maintain valued aspects of place, has been documented throughout this dissertation (see Chapter Six especially). As noted in Chapter Two, beliefs and values about a place are an important part of place identity (Proshansky et al., 1983). Community members in Fort Resolution have a shared love of the land and connection to water generally, and places specifically (see Chapter Four). This love of and connection to the land and water is rooted in a value system that is informed by person-place relationships. Thus, people derive their identity from what they value, feel and believe about place(s).

These connections to place are influenced by a number of themes, including heritage, health and wellbeing, social connections, the idea that 'water is life', what the land and water provide (among others). Through these experiences, specific place identity constructs, including self-esteem and self-efficacy, rootedness and sense of belonging emerged. In Chapter Five, experiences of community-identified changes to the Slave River watershed, and other nearby

water bodies, were discussed. These changes are having profound impacts on people in the community, and are associated with experiences or feelings of loss (see Chapter Six). These experiences of change are influencing place identity constructs, including continuity and security, rootedness and sense of belonging, and self-esteem and self-efficacy.

Community members feel that they are increasingly required to adapt to a wide range of changing water conditions (Chapter Five; see also Wesche, 2009). Adaptation and adaptive capacity are multi-dimensional, and shaped by many forces and drivers that interact and intersect at multiple scales (Adger et al., 2005; Adger & Vincent, 2005; Vincent, 2007). Examples of key adaptations, including both short-term coping responses, longer term strategies, and desired community actions were highlighted in Chapter Six. As also noted in Chapter Six, many of the choices that people are making at individual and collective levels around adaptation reflect place identity, love of and connection to water and place(s) or frustration with loss of values associated with important places. Thus, we begin to see emergence of a relationship between place identity, impacts to place and how people understand and deal with impacts and change. Additionally, as was revealed in the analysis, and will be discussed below, dimensions of adaptive capacity also serve to impact or reinforce the manifestation of place identity. Thus, the relationship between place identity and adaptive capacity, in the case of Fort Resolution, appears to be one that is bidirectional, and can be at times mutually reinforcing.

In this Chapter, I draw on the empirical evidence presented in Chapters Four through Six, as well as theoretical insights from diverse literatures (see Chapter Two) to delve deeper into the connections between constructs of place identity and dimensions of adaptation and adaptive capacity. The foundations laid in previous chapters, coupled with the above analysis of dimensions and constructs in relation to responses set the stage for piecing together the

relationship between place identity and adaptation and adaptive capacity. The discussion in this chapter will thus explore not only how place identity intersects with dimensions of present adaptation, but also how place identity may influence future ability to adapt (adaptive capacity). This is consistent with the CAVIAR framework utilized in this research (Chapters Two and Three), in that understanding present adaptive strategies can help to elucidate potential future adaptive capacity and the forces that shape that capacity in relation to potential future exposure-sensitivities (as described by community members in Chapter Five). This Chapter addresses research Objective 3, and its associated sub-objectives.

In addition to the empirical evidence in Chapters Four through Six, and the theoretical analysis in Chapter Two, the actions and adaptation responses identified in Chapter Six were coded using the identified dimensions of adaptation and adaptive capacity (Chapter Two) to reveal how such dimensions are manifested and experienced in relation to responses against community-identified water changes (Table 6). Actions and responses were also coded for place identity constructs, to begin to examine how place identity constructs emerge in relation to discussions about adaptation and adaptive capacity (Table 7).

***Table 6: Dimensions of Adaptation and Adaptive Capacity Reflected in Identified Adaptation Responses***

<b>Dimension</b>	<b>Number of Respondents</b>
Valuing future livelihoods	7
Values	13 + Focus Group (FG)
Social capital	6 + FG
Perceptions of capacity	16 + FG
Multiple knowledges	2
Learning	7 + FG
Information	19 + FG
Equity	19 + FG
Economic resources	2
Differing values	17 + FG
Culture	3
Collective action	18 + FG

**Table 7: Place Identity Constructs Reflected in Identified Adaptation Responses**

<b>Construct</b>	<b>Number of Respondents</b>
Social connections	4
Sense of belonging	21 + Focus Group (FG)
Self-efficacy	30 + FG
Security	15 + FG
Rootedness	11 + FG
Environmental skills	2
Distinctiveness	1
Continuity	17 + FG
Commitment to place	20 + FG

In Table 6, we see that a number of dimensions of adaptation and adaptive capacity emerged in relation to the identified responses in Chapter Six. A number of dimensions emerged as interlinked. Based on the discussion in Chapter Six, and upon further review of the data, it appeared that the dimensions of equity and perceptions of capacity were intimately linked, and they will be discussed together. Three interlinked value-related dimensions also emerged: values (broadly), valuing future livelihoods and differing values, which are treated in concert together below. Culture, multiple knowledges and learning all emerged, but less so than some of the other dimensions. However, given the importance of multiple knowledges, culture and heritage to the community (see results in Chapter Four and Chapter Six) these are explored further in this Chapter as interlinked concepts. Finally, social capital and collective action were also emergent themes, particularly collective action. These two themes were intimately linked, as collective responses identified in Chapter Six require networks and collaboration to achieve, as noted by participants. All of these dimensions are explored in detail below.

In Table 7, we see the emergence of key place identity constructs in relation to adaptation responses and future adaptive capacity. Notably, self-efficacy, sense of belonging, rootedness, security and continuity had the greatest number of responses. This is not surprising, given the

importance of the constructs in relation to place value themes in Chapter Four, and the experiences of impacts identified in Chapter Six. All of these constructs will be explored throughout the key adaptation and adaptive capacity dimensions, based on empirical evidence, theoretical foundations and this analysis. Environmental skills, which emerged strongly in Chapter Six, did not emerge as strongly in relation to adaptation responses. However, given its importance to place identity and its impacts from change, and its strong links to self-efficacy and continuity (as identified in Chapters Four through Six) it will be touched on throughout this chapter.

## **7.2 Examining the Linkages between Place Identity and Adaptive Capacity**

As noted above, four key clusters of adaptation and adaptive capacity dimensions emerged in the analysis of adaptation responses, and building on the identified experiences of place identity, community-identified exposure-sensitivities and experiences/impacts to place identity from said change. In this section, each dimensional cluster will be discussed, as will the role of place identity in shaping (or being shaped by) the dimensions identified in that clustering. Some of the dimensions identified fall more within identified subjective dimensions on adaptive capacity (e.g., values, perceptions of capacity) (see for example, Grothmann & Patt, 2005; O'Brien & Wolf, 2010; Kuruppu and Liverman, 2011; Wolf et al., 2013), while others are more objective in nature (e.g., information) (Yohe & Tol, 2002). Some dimensions are reflections of forces that shape access and entitlements to dimensions of objective adaptive capacity (e.g., equity, social capital and collective action) (see for example, Watts & Bohle, 1996; Adger & Kelly, 1999; Adger, et al., 2005; Armitage, 2005). Whether subjective, objective or existing

within the interplay between the two, place identity appears to play a role (in varying degrees) in shaping how these dimensions manifest and result in adaptation. As will be discussed below, the relationship between place identity and these dimensions may also have important insights for understanding and fostering future adaptive capacity.

### ***7.2.1 Values, Valuing Future Livelihoods and Differing Values***

Values are identified in Chapter Two as a subjective dimension of adaptive capacity (Adger et al., 2009; O'Brien & Wolf, 2010). Values can be defined as “standards or criteria to guide not only action but also judgment, choice, attitude, evaluation, argument, exhortation, rationalization, and, one might add, attribution of causality” (Rockeach, 1979, p. 2; as cited in O'Brien & Wolf, 2010, p. 233). Indeed, values are a dimension of adaptive capacity, but they also encapsulate experiences of place identity. Values are fundamental to place meanings, and as Cheng et al., (2003, p. 89) note, “place meanings encompass instrumental or utilitarian values as well as intangible values such as belonging, attachment, beauty, and spirituality.” Broad values related to water generally and place(s) specifically, emerged and were identified in Chapter Four. These place-based values are so important to community members that they contribute to how individuals and the community identify and see themselves. Chapter Five explored how valued places are being impacted by community-identified exposure-sensitivities, while Chapter Six highlighted how these values have been impacted by change and what people are doing in response.

Evident throughout this dissertation is the importance that many community members place on the continuity of valued places and identity for future generations. This is evident

through perceptions of changing water and place, a desire to protect water and place from the changes perceived as threatening, and concerns about what the future holds in terms of changes (see Chapters Five and Six). These concerns for the future, and desire to protect culture, knowledge and way of life for the future, imply that a value is placed on the future, or that participants are ‘valuing future livelihoods’ (Chambers and Conway, 1992). Participants also discussed the importance of passing on traditional values and skills, as was discussed in Chapter Six and will be further unpacked below. This can reflect a desire to ensure values remain continuous.

Differing values, both within the community and between the community and outside actors (of multiple types and at multiple scales) emerged strongly. This was most pronounced in term of discussion of equity and control over decision-making related to community-identified water changes and their causes, as will be discussed further below. Values and differing values also emerged in relation to information (and the sharing thereof) and to social capital and collective action. Differing values can to a certain extent highlight an ‘us’ versus ‘them’ mentality, reflecting the notion of what does and does not belong in a particular place, which stems from how people value and identify with that place (Sibley, 1995; Cresswell, 2004).

While values, valuing future livelihoods and differing values, emerged as distinct dimensions through the analysis of adaptation responses discussed above, based on the empirical and theoretical evidence presented in this dissertation, in the case of Fort Resolution it appears that these dimensions are embedded throughout the analysis and discussion of all dimensions and their relationship to place identity – and each other. Given that place identity is founded on values and shaped by value systems, as noted above (see also Proshansky et al., 1983; Cheng et al., 2003), and that values of place strongly shape how place identity is experienced in Fort

Resolution, it is not surprising that these dimensions interact and intersect with all of the other dimensions that will be described below. Given the overarching nature of these value based concepts which fundamentally stem from place identity, values, valuing future livelihoods and differing values will be explored in concert with the dimensions discussed below.

### ***7.2.2 Multiple Knowledge Systems, Culture and Learning***

Multiple knowledge systems and learning have been identified as key dimensions of adaptive capacity (see for example, Berkes & Jolly, 2011; Ludwig et al., 2001; Olsson et al., 2004; Huntington & Fox, 2005; Pelling et al., 2008; Diduck, 2010; Plummer & Armitage, 2010; see also Table 2 in Chapter Two). They are explored in concert in this section because, in the case of Fort Resolution, they emerged as strongly interconnected. Knowledge (including Traditional Knowledge) is rooted in culture and passed down through processes of learning. These specific dimensions can also be influenced by place identity, and vice versa. Learning and multiple knowledge systems were discussed in Section 6.2, in conjunction with primarily collective adaptation responses, including connecting people to the water and land and collaborative action. Furthermore, learning and knowledge (through transmission of knowledge and mastery of environmental skills) shaped key aspects of place values and identity (notably heritage, what the land provides and respecting water), as noted in Chapter Four.

One critical aspect of information and knowledge sharing that is fundamental for adaptation and adaptive capacity is the transmission of local and Traditional Knowledge (see Table 2). As discussed in Chapter Three, Traditional Knowledge is “a cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living being (including humans)



with one another and with their environment” (Berkes, 2008, p. 7), in which “meanings and values are rooted in the land and closely related to a “sense of place”” (Berkes, 2008, p. 6). Traditional and local knowledge are fundamental to the people of Fort Resolution, as evidenced by the quotations from Arthur Beck (pers. comm., 2011) and Wilfred Beaulieu (pers. comm., 2011) in Section 6.2.2.1 of Chapter Six (see also Wesche, 2009). Traditional and local knowledge are an important part of decision-making locally, including individual behaviours and broader group processes such as environmental stewardship programs and collective action processes (e.g., the SRDP) (Participant Observation, Author, 2008-2014). Community members also strongly advocate for having Traditional and local knowledge – and related values – included in broader scale decision-making processes, as will be discussed further below.

As noted in Chapters Four and Six, Traditional and local knowledge sharing is a critical piece of place identity for many people, through the spaces, places and networks this sharing takes place. Heritage and connections to culture are fundamental for why many people in Fort Resolution identify strongly with certain places. Values are an important part of the knowledge and skills that are passed down, including how people should act and behave in relation to the environment. Traditional knowledge is also reflected in the concept of holism, described in Section 4.7, in that all parts of the environment – including people – are interconnected, and impacts to one component can have cascading effects of other components. Interacting with and respecting the environment (as also described in Section 4.7), is, for many community members, shaped by knowledge passed down through generations and their own experiences and love of place.

Traditional knowledge plays an important role in adaptation, and in shaping individual and collective adaptive capacity (Berkes & Jolly, 2001; Furgal & Seguin, 2006; IPCC, 2007;

Huntington & Fox, 2005; Berkes, 2008). Adaptations are encapsulated in the stories and teachings that are passed down between generations. People who have lived in and used a place – an environment – are knowledgeable about how to use that place, recognizing changes to that place, and “the surprises that are inherent in their ecosystems and ways of life” (Huntington & Fox, 2005, p. 90). Ways of understanding change and dealing with it are part of the learning that takes place when Traditional and local knowledge are transmitted (Berkes, 2008; Wesche, 2009). Looking to what people have done before, both with respect to dealing with change and caring for the land, can help in making choices about how to protect and use places. Passing on Traditional Knowledge, values and skills in Fort Resolution is seen as a way of equipping people with the ability to deal with water change – increasing adaptability. This is consistent with findings from Wesche (2009) who also worked with the community of Fort Resolution, examining the relationship between Traditional Knowledge and adaptation. Passing on Traditional Knowledge can promote a certain way of using the land (or land ethic, which is based in a values system) which promotes a continuity of place, and can serve to reduce impacts to place from local users. Indeed, many community members discussed the importance of passing on Traditional Knowledge, values and skills to younger generations to help protect valued places, as evidenced by the quotations in section 6.2.2.2.

Learning, such as that which takes place through transmission of Traditional Knowledge, can contribute to adaptive capacity by resulting in transformative behavioural changes (e.g., Bandura, 1982). In Fort Resolution, discussions of learning were typically related to learning land-based skills and drawing from collective wisdom through Traditional Knowledge and cultural values. Engaging people in learning processes can be a mechanism for transmitting place values, and connecting people to their heritage, thereby instilling love of place, feelings of

rootedness and sense of belonging – all important aspects of place identity. Strong feelings of rootedness and sense of belonging can contribute to perceptions of capacity and self-efficacy, and can in turn influence participation in collective action processes (as will be discussed below). As noted in Chapter Six, focus group participants advocated that young people be taught traditional values and ‘*understand while they’re younger*’ (Focus Group Participants, pers. comm., 2011). Passing on traditional values can influence how people care for land and how they understand, cope with and adapt to change. Given that people are often more willing to fight for places that are part of who they are (Stedman, 2002), transmitting these values can contribute to long term willingness to protect place, which contributes to adaptive capacity. Even youth, such as Miranda, Paul and Morgan, all wrote about their desire to learn things from their families and the importance of their culture in their photo essays (see sections 4.2 on heritage and 4.5 on social connections). This further reinforces the critical need to pass on traditional values and skills to younger generations, to instil feelings of rootedness, sense of belonging and environmental mastery, and thus foster place identity.

Traditional Knowledge and skills are not being passed to younger generations to the extent they once were (Wesche, 2009), which can potentially undermine the transmission of key place-based values that factor into the place identity of many people (see Chapter Six). With increasing Western influence and shift towards the wage-based economy, many members of young generations are finding themselves caught between two worlds (Wesche, 2009). It is important to create space for Traditional Knowledge transmission, because it “is key to ensuring that it [*Traditional Knowledge*] evolves and remains a relevant and applicable source of information” (Wesche, 2009, p. 322). Connecting people to the water and land, and creating spaces for passing on values, skills and knowledge, emerged as a potential opportunity for

building and fostering adaptive capacity in the community. In Chapter Six, participants raised the importance of culture camps and land-based activities as mechanisms for young people to connect with the land and water and with their culture (Focus Group Participants, pers. comm., 2011; Velma Delorme, pers. comm., 2011; Anonymous, pers. comm., 2011c). One participant (Lawrence Fabien, pers. comm., 2011) did note that young people are still engaged in trapping, and the practice is stronger in Fort Resolution as compared to other communities.

This promotion of transmission of Traditional Knowledge, values and skills can foster adaptive capacity to deal with future changes (such as those identified in Chapter Five) in the Slave River and Delta and also promotes strengthened place identity through connections to heritage, environmental mastery, rootedness and sense of belonging. All of these constructs were identified as important for place identity of community members of Fort Resolution. And, as will be evidenced below, these constructs support other dimensions of adaptation and adaptive capacity, further highlighting the importance of Traditional Knowledge for place identity.

Strong love of and connection to place (through heritage connections specifically) in Fort Resolution appears to influence the desire to pass on values, knowledge and skills to younger generations. At the same time, transmission of knowledge, values and skills appears to support strengthening place identity through rootedness, sense of belonging and environmental mastery. Thus, the relationship between place identity and Traditional Knowledge is iterative.

Bridging and linking multiple knowledges is also critical for adaptive capacity. Bridging multiple knowledge perspectives brings together multiple ideas and values, potentially revealing solutions that draw from these multiple ways of thinking about and knowing the world (Ludwig et al., 2001; Olsson et al., 2004; Folke et al., 2005; Armitage, 2005; Wesche, 2009; Armitage & Plummer, 2010). Bridging multiple knowledge systems is an important dimension of adaptive

capacity in Fort Resolution. People want to understand what is happening to places that are important to them, and working with multiple actors can help to increase that knowledge to support making decisions that best serve to protect places.

Bridging multiple knowledges, with respect to research, monitoring and management on the Slave River and Delta, has been a critical goal of the SRDP (see Chapter Six). A meeting held in Fort Smith in 2011, prior to the official formation of the SRDP, brought together people who were concerned about the Slave River and Delta and wanted to work towards stewardship of the areas. At this meeting,<sup>33</sup> workshop participants stressed that building collaborative partnerships between multiple groups is critical for research and monitoring of the Slave River and Delta. Participants also indicated that Traditional Knowledge holders must be engaged in monitoring and research design, and that Traditional Knowledge “plays an important role in completing the picture of the health of the aquatic ecosystem” (AANDC/GNWT, 2012, p. A-18). The outcomes of this meeting, including ongoing relationship building Between Traditional Knowledge holders and western scientists, have become important practice for the SRDP. Linking of knowledge systems remains a critical aspect of the SRDP in all of the research and monitoring the group undertakes (Participant Observation, Author, 2011-2013).

Wesche (2009) also discussed the importance of linking Traditional Knowledge and Western science for adapting to environmental change in Fort Resolution. Information from both types of knowledge plays a critical role in building the knowledge, information and skills necessary to adapt to watershed change. Community members see value in the use of scientific knowledge, alongside Traditional Knowledge, and how it “advances the potential for individuals to more critically evaluate environmental information from different sources, to better

---

<sup>33</sup> Note: I participated in this meeting, as a partner/collaborator to DKFN.

understand potential risks, and enables them a wider range of choice in selecting response strategies” (Wesche 2009, p. 333). As described in Chapter Six (see quotes in Section 6.2.2.1), community members are more than willing to work with external partners to protect place – as long as their values and knowledge are respected in the process.

Drawing on and bridging multiple perspectives can lead to the creation of more robust policies for adaptation and water stewardship, by drawing on a larger base of knowledge from which to make decisions (Berkes, 2008), and the consideration of nuanced solutions that may not be expressed when utilizing only one type of knowledge perspective. However, linking Traditional Knowledge and Western science is fraught with challenges and further work is needed to explore the ways in these knowledge systems can be used together – and whether such ‘integration’ is desirable in the first place (Berkes, 2008; p. 270).

### ***7.2.3 Information***

Having the necessary information to make decisions about water management and adaptation planning is critical for the success of adapting to environmental change (Fankhauser & Tol, 1997; Smit et al, 2001; Swanson et al., 2007; see also Table 2). Understanding the problems being faced, the causes or drivers of those problems, and identification of appropriate strategies and tools for dealing with those problems can greatly improve how people adapt to and deal with change. Knowledge about available options and ability to assess and select from those options is an important aspect of adapting to change (Fankhauser & Tol, 1997). Information emerged as an important dimension of adaptive capacity for community members in Fort Resolution, and is linked to the above discussion on learning and knowledge sharing. Community members recognize the power of information – from multiple knowledge

perspectives – in coping with environmental change, taking action against change, and planning for the future.

A few participants (e.g., one Anonymous male land user, pers. comm. 2011e; Wilfred Beaulieu; pers. comm., 2011) discussed recording their observations and experiences on the land, or wanting to engage in personal studies, in an effort to keep track of information necessary to use the land from year to year (see for example Section 6.2.1.3). This tracking can represent a strong attachment and commitment to place, in an effort to fully understand the continuity of place (through observation and environmental mastery). Such information also helps to keep track of changes, and can be important for understanding the aquatic environment as a whole. Understanding these changes can support adaptation planning and watershed management, both in the short and long terms.

However, one of the major challenges in the community of Fort Resolution, was the perception of lack of information<sup>34</sup> flow back to communities following research undertakings. As noted in Section 6.2.2.1, participants expressed frustration at not hearing the results of studies, and more people coming in to do work on similar topics when previous information has not been shared (whether related to the new study or not). It can be frustrating for people when their identity is tied to a particular place that has been studied to not receive the results of that study. They value the places being studied and want to know what research shows about those places. Fear and uncertainty about changes was a common experience for community members in relation to the changes they feel they are experiencing. Changes are impacting the ways people use the land (as noted in Chapter Six), which can serve to sever connection to loved places that

---

<sup>34</sup> This includes information not coming back to the community; information being improperly disseminated to or in the community (bottlenecks); capacity to disseminate or utilize information at multiple levels; use of technical language creating a barrier, etc.

are part of identity, and the constructs they support (e.g., rootedness, social connections, sense of belonging, self-efficacy, etc.; as described in Chapter Six, section 6.2), that can in turn also foster particular dimensions of adaptive capacity.

Not receiving information can promote or reinforce uncertainty and fear, and feelings of (in)security, particularly in cases where there is perception of a problem (such as in the case of mistrust of water, or where water changes are seen as coming from, as discussed in Chapter Five). This can further exacerbate impacts to place identity, with cascading effects. This is most evident with respect to the feelings of mistrust related to safety of water, described in Section 6.2.1.2 of Chapter Six, related to perceived changes in quality (as noted in Chapter Five). When people are concerned or mistrustful of their water, they want to know what is happening. With respect to water quality, instrumental evidence indicates that water is safe, while anecdotal evidence suggests perceptions of poor water quality. Lack of information sharing can reinforce feelings of mistrust in the quality of the water and being scared about what is happening, as without information it can be hard to know what is truly taking place. This can (and does in the case of Fort Resolution) result in changing behaviour or making adaptation choices that impact connections to place (such as not drinking water or carrying water when travelling on the land).

As noted in Chapter Six, DKFN environment manager Patrick Simon (at time of interview; pers. comm., 2010) explained that the community wants to work with individuals with similar values – which include an openness to sharing, collaborating and a love of the places involved in research investigation. Not receiving information (or the perception that information is not flowing to the people who want it) can result in feeling as though concerns – and the places where those concerns are manifest – are not being heard, validated or valued. Thus, this lack of information flow can potentially sever or impede the development of partnerships



between multiple groups that contribute to the development of social networks that are so important for adaptive capacity (that will be discussed in subsequent sections).

#### ***7.2.4 Perceptions of Capacity and Equity***

An individual's perception of his or her ability to adapt and deal with change is an important subjective dimension of adaptive capacity (e.g., Lorenzoni et al., 2000; Adger et al., 2004; Grothmann & Patt, 2005; Kuruppu & Liverman, 2011; Wolf & Moser, 2011). There are several components or socio-cognitive processes that feed into an assessment of capacity to adapt, including risk awareness, willingness to adapt, and self-esteem and self-efficacy (Grothmann & Patt, 2005; Kuruppu & Liverman, 2011). As noted in Section 6.2.1.2 in Chapter Six, there are varying levels of perceived capacity at individual and collective levels leading to varied adaptive responses.

In this research, concepts of self-esteem and self-efficacy emerged out of the discussion around health and well-being, and how this is an important part of maintaining healthy people and communities. As noted in Chapters Four and Six, place identity for many people is informed by how they feel when out on the land, which includes a sense of feeling like one's best self and feeling more alive and more capable when out on the land. Conceptualizations of place identity for many were also strongly tied to a sense of belonging (whether to specific place, group of people or culture), which both shapes and is shaped by self-esteem and self-efficacy. Mastery of the land and skills for using and knowing the land (Proshansky et al.,'s [1983] concept of 'environmental skills') was also shown to contribute to self-esteem and self-efficacy in Chapter Four.

When a particular place meets the needs of people using it, it can positively bolster self-efficacy and esteem, and conversely, when places change or become unmanageable, self-efficacy can be threatened (Korpela, 1989; Twigger-Ross & Uzzell, 1996). Changes to the landscape – including impacts on water – were noted as having impacts on overall self-esteem and self-efficacy in Chapter Six. Community members noted no longer feeling able to use the land in the ways they used to or do the things they used. For example, participants talked about the importance of dipping their cup in the water and drinking directly from the river. Participants today are leery of doing this and often will carry bottled water to feel safer (see Chapter Six). In many cases, these activities, or ways of using the land (functional and experiential attributes, as well as the importance of these places as social spaces), were a large part of the meanings that people ascribed to them. As such with these changes (as noted in Chapter Six), feelings of belonging, security, familiarity and continuity are being impacted, making these places more unmanageable. If people can no longer use places in the ways they used to, this denotes feelings of lack of capacity or perception of being able to complete particular tasks. Additionally, losing access to special and treasured places can result in loss of sense of security and sense of belonging, as noted in Chapter Six.

When places change, the characterization, experience and perception of these changes (and related impact to place-based meanings and relationships) can be fed back into cognitive understandings of adaptive capacity and perception of risk (Wester-Herber, 2004). From an adaptive capacity perspective, self-esteem and self-efficacy have been largely explored in terms of the cognitive framings of climate change adaption (see for example, Grothmann & Patt, 2005; O'Brien & Wolf, 2010; Kuruppu & Liverman, 2011). Self-esteem and self-efficacy are reflected

in willingness to adapt and perception of capacity to adapt, both cognitive, individualized processes.

Section 6.2 described both individual and collective adaptations that people are taking to address change. Adaptations can range from traveling to different locations or hunting at different times of the year, to engaging in place-protective behaviours and joint group processes (e.g., Slave River and Delta Partnership; water advocacy; culture camps, etc.). Some adaptations are reactive, such as changing the timing of hunting, or bringing bottled water when traveling on the land. Others are done both reactively and proactively, in an effort to address and ameliorate change in the region. These actions include teaching traditional values and engaging in place-protective behaviours, advocacy and collective processes.

People engage in place-protective behaviours to protect important places and what they value about those places (Stedman, 2002; Devine-Wright, 2009). As Stedman (2002, p. 577) states, “we are willing to fight for places that are more central to our identities and that we perceive as being in less-than-optimal condition. This is especially true when important symbolic meanings are threatened by prospective change.” In the case of Fort Resolution, protecting place includes protecting heritage values, social connections, health and well-being, functional and experiential attributes and water as a life force (see Chapter Four). Protecting these places retains continuity of their meaning and function. As evident throughout this dissertation, people want places to remain the same, in terms of function, use and character – and want the values associated with those places to remain continuous (see especially Section 6.2.1 in Chapter Six).

Willingness to engage in place-protective behaviours denotes self-efficacy, in that people have confidence that engaging in such behaviours will improve or ameliorate impacts of water change (see discussion in Chapter Six; see also Grothmann & Patt, 2005). For example, in

section 6.2.1.3, Raymond Simon (pers. comm., 2010) described the importance of protecting the water now, and teaching others how to protect it, so that it remains healthy for future generations. This shows not only a willingness to work to protect place, but a feeling of self-efficacy that doing so will preserve or maintain the water for the future. As noted earlier in this Chapter and in Chapter Six, participants in the focus group indicated the importance of teaching young people traditional values, which includes respect for water (Focus Group Participants, pers. comm., 2011), so that young people can continue to protect, use and value the land in a way that is consistent with traditional values and culture. Indeed, valuing future livelihoods is an important determinant of adaptive capacity (Chambers & Conway, 1992), as noted earlier in this Chapter. This highlights the importance of social acceptability of adaptation options (Adger, 2003) and the need for culturally- and locally-appropriate adaptation strategies (Relph, 2008) that reflect community values and identity.

The actions and adaptive behaviours identified in Chapter Six, Section 6.2, reflect things that fall within people's purview for their capacity to adapt. Taking actions, such as place protective behaviours and engaging in collective processes, can reflect a love of place that stems from a sense of belonging to or a rootedness with to a particular place. Protecting a place, and seeing tangible results, can further reinforce self-esteem and self-efficacy.

However, when it comes to engaging in adaptive behaviours, it also becomes clear that enabling conditions play a role in people's perception of their capacity to adapt to change or engage in collective activities. This emerged in a number of interviews with community members (see Chapter Six). As land user Kenneth Delorme (pers. comm., 2010) explained, there is not much that can be done by people in the community, rather they will have to get used to the changes and adapt to it. This sense of 'what can we do?', or feelings of resignation, seemed

pervasive in the community, both through interviews and from my time living there (Participant Observation, 2010-2011; see also Section 6.2.1.1 in Chapter Six). As noted in Chapter Six, many participants talked about a ‘David and Goliath’ type of situation, and felt that there was little they could do to stop people with power and money. Thus, many feel that decisions about places they love are out of their hands, and their values are being impacted by people who are not connected to those places.

For people (but not all people in the community), the feeling of ‘*what can we do?*’ against outside groups with more power, money and control, could lead to a sense of resignation, and of not being able to effect change – or a lack of efficacy. This also demonstrates issues of equity, another key dimension of adaptation and adaptive capacity, and one that emerged strongly in this research. There is a perception that government and industry do not care about the people of the community, and make choices about water use that do not consider the people affected. Because of this, the people have no control or say over what happened. There is seemingly a strong feeling of ‘our place’ versus ‘their place’ (see Cresswell, 2004), and that people making decisions about the Slave watershed are not from that place and cannot truly understand how it is valued by the community. People who live, love and use places in and around Fort Resolution have come to define places in specific ways, based on certain features and experiences (see Chapter Four). With sense of belonging, comes feelings of ‘insiderness’ (Relph, 1976), and certain practices – and people – that are deemed acceptable or unacceptable within the boundaries of place(s) (Sibley, 1995; Cresswell, 2004). Community members have a sense of belonging to and in that place that outsiders cannot have because they do not have history with that place and do not belong there in the eyes of insiders.

In Section 6.2.1.1 in Chapter Six, Elder and land user Henry McKay (pers. comm., 2010) described feeling that community members are treated like dogs, that they are not important. This strongly encapsulates the perceptions of inequity in the community, and can contribute to the feelings of resignation (see Chapter Six) or hopelessness about affecting change. This reflects feeling of lack of agency and control in resource decision-making, and highlights the importance of examining the nature of scale (and interactions between scales) in understanding place identity, adaptive capacity and the relationship between the two.

However, this is not to say that understanding personal feelings of capacity (or agency) are not important to understand, or superseded outright by decisions at broader scales. As Adger et al. (2009) and Grothmann et al. (2013) note, individual level factors that shape adaptation decisions can also serve to constrain how people engage in collective action. I would argue that individual level decisions not only constrain, but can in some cases facilitate. Indeed, as will be evident below, people are increasingly turning to collective processes to protect the places they value and love. These choices reflect people's perceptions of capacity to effect change in concert with other community members and others in collective action solutions. Thus, it is important to understand individual level perceptions and motivations, which as shown throughout this dissertation are in part shaped by place identity and values assigned to places that inform that identity.

Conversely, people may desire to do something to protect places, or adapt to changes, but may not have the resources or capabilities to do so (Grothmann, et al., 2013). Creating opportunities to foster engagement, including through access to necessary resources and addressing institutional, cultural and social barriers can potentially improve capacity at

individual livelihood levels, as well as filter up and shape adaptation and capacity at collective levels.

Overall, in Fort Resolution, perception of capacity to adapt takes two distinct paths. On one hand, people are engaged in activities to support and protect places, and engaging in these actions demonstrates a perception of efficacy. On the other hand, people are feeling helpless against impacts that are seemingly beyond their control. In some cases, individuals who lamented ‘what can we do?’ are also involved in collective action processes or place protective behaviours. This suggests that perception of capacity to adapt is complicated and incredibly nuanced. This points to a need for further research on what shapes perceptions of capacity (with particular emphasis on self-esteem and self-efficacy) in the community.

Promoting and fostering strong self-esteem and self-efficacy for capacity to address and adapt to change in multiple ways – including promoting and creating space for development of place identity – can contribute to overall health and well-being, which can further reinforce esteem and efficacy for adaptation. If stewardship (i.e., place-protective behaviours) for water is considered an adaptive strategy, continuing to foster and promote people’s connections to place can go a long way to engage people individually and collectively (Kofinas & Chapin, 2009) and build capacity to deal with future changes, both reactively and proactively. As Kofinas and Chapin (2009) state, “people’s appreciation for their relationship to nature....is often a strong motivation for ecosystem stewardship and sustainability and can be a powerful stabilizing feedback for managing rates of change” (Kofinas & Chapin, 2009, p. 62). Therefore, as changes continue to impact the places that people love and identify with, it will be increasingly critical to maintain place identity and place-based relationships, in order to maintain self-esteem and self-

efficacy so that people feel effective in engaging in adaptive behaviours such as stewardship activities.

### ***7.2.5 Social Capital and Collective Action***

As noted in Chapter Two, social capital shapes and is a necessary component of collective action (Adger, 2003). Social capital focuses on relationships that exist between actors, the linkages that bring those actors together, and how people use those relationships to accomplish goals, as identified in Chapter Two (see also Adger, 2003; Tompkins & Adger, 2004; Armitage, 2005). As identified in Chapter Six, many participants noted the importance of working together in an effort to address ongoing community-identified water changes. In the case of Fort Resolution, collective action for water is supported by partnerships, networks and bridging and bonding ties, though challenges are present. Engagement in collective action, from joint group processes, to advocacy to connecting people to the land, in part stems from a desire to protect valued components of places people identify with. Shared values were part of bringing people together in collective action processes.

Community members are engaged in a number of collective partnerships activities to promote protection of water, as described in Chapter Six, both within the community and with outside partners. One key example of collective action is the SRDP, which stems from, and is founded on, shared values of water by community members in Fort Resolution and Fort Smith, as well as external partners (E. Kelly, pers. comm., May 23, 2013; see discussion in Chapter Six). People came together in this partnership because of concerns they had with respect to changing water conditions in places that mattered to them, and the group that formed engages in actions to better understand these changes for the ultimate goal of influencing decision-making



and long-term stewardship activities. Though there is diversity in the values of the group, the shared sense of the importance of protecting water is the core value that the group coalesces around (Participant Observation, Author, 2012). As noted in Chapter One, however, feelings and words about engaging in place-protective behaviours for the Slave River do not always translate into action on the ground. Capacity and resource issues often prevent full participation. Furthermore, many of the people at the table are not the actors ‘doing the work’ on the ground, which could point to a disconnect in values between SRDP members and broader community members (Participant Observation, 2012-2013).

Ongoing recognition and affirmation of shared goals and common values could further support the SRDP and engage the right people for action. For example, presently, the SRDP does not have a guiding vision statement. Development of a mission statement that recognizes multiple partner values, and the goal of understanding and protecting the Slave River, could serve to strengthen commitment to the cause.

Ongoing participation in the SRDP continues to cement the shared values and identity of the people involved, while working to engage in monitoring programs that can ultimately contribute to protection of place (place protective behaviours). Conversely, differing values have – and will likely continue – to emerge within and through the SRDP process. This is not unexpected, and is a normal part of group development. It also becomes possible to identify commonalities (like the overall goal of protecting the Slave River watershed) amongst these differing values, creating opportunities to bridge divergent value sets.

Bringing multiple groups within the community together, however, can – and has – posed challenges (Participant Observation, Author, 2010-2011). Wesche (2009) noted that divisions between Dene and Métis have been influenced by differential legal treatment and benefit

allocation, resulting in distinct identities and tensions between groups. Power dynamics between family groups also creates divisions in the community, where family allegiances will influence trust and interactions between people (Wesche, 2009). These social divisions, whether cultural or personal, can preclude or influence opportunities for joining together to address water issues. Increasingly, however, community members from different cultural and social groups are coming together at a technical level, though tensions may remain at the political level (Participant Observation, Author, 2010-2013). It is also evident from Chapters Four, Five and Six, that many community members – regardless of Aboriginal group affiliation – share common values related to water and place, are experiencing exposure-sensitivities in similar ways, and are experiencing impacts to place identity from community-identified changes in similar ways. Thus, group affiliation does not impact how people connect with, use and experience place, but is part of the broader institutional structure that shapes adaptation and adaptive capacity at multiple scales.

Trust of partners (particularly outside partners) is a strong factor in shaping watershed activities in Fort Resolution (Participant Observation, Author, 2011-2012). As identified in Section 7.2.4 above and in Section 6.2.1.1 in Chapter Six, there are feelings of inequity and powerlessness in relation to government and industry activities, and trust in those actors is not always strong. In a survey on trust of local service providers, Wesche (2009) found that roughly 40% of community members had low trust in the territorial government, and only five percent had high trust in GNWT. Based on discussions of the role of industry in community-identified watershed changes (see Chapter Five), it can be ascertained that trust in industry is quite low. Furthermore, lack of information flow from academics, and experiences with researchers who come and never return, impacts the level of trust held in academic institutions. Collective action

situations and partnerships require a certain degree of information flow and linkages between actors involved (Bodin, et al., 2006). Social capital is built on feelings of mutuality, reciprocity and trust (Adger, 2003; Pelling & High, 2005), and this is important in Fort Resolution, as evidenced above in Patrick's Simon's statement about working with likeminded individuals in section 6.2.2.1. However, perceptions of lack of information flow from outside parties to the community, as described above, may undermine the development of trust and feelings of reciprocity and potentially impact collaboration. For example, as noted in Chapter Six, many participants described feeling like they never receive results of research studies (e.g., Darwin Unka, pers. comm., 2011; Trudy King, pers. comm., 2011). The establishment of long-term networks and partnerships, based on shared values and reciprocity, can also increase the level of trust, further reinforcing collaboration in multi-party activities and collective action and strengthening adaptive capacity (Adger, 2003; Pelling & High, 2005; Davenport et al., 2007; Fresque-Baxter & Armitage, 2012).

As described earlier in this chapter, linking multiple knowledge systems together is important for building adaptive capacity, because of the range of information that can be drawn upon. Linking multiple knowledges can also play a role in shaping social capital to influence adaptive capacity. Land user Arthur Beck (pers. comm., 2010) discussed the criticality of linking Traditional Knowledge and Western science together (see Section 6.2.2.1), in order to develop a robust understanding of changes taking place to important community waters. This is a key avenue for future partnerships that work towards understanding and addressing change. Identifying ways to link Traditional Knowledge and Western science, and an openness of partners from different perspectives to accept different knowledges and seek ways to work together will be critical for building social capital to deal with increasing change. When

networked actors are willing to listen and find ways to bridge diverse knowledge systems (and the values upon which they are founded), trust and reciprocity are reinforced.

Shared meanings and values can contribute to social capital, which in turn can shape collective action (Cheng et al., 2003; Manzo & Perkins, 2006), including through building and reinforcement of trust amongst people (Davenport & Anderson, 2005; Davenport et al., 2007). As Manzo & Perkins (2006, p. 344) note, “shared emotional ties to places strengthen social relationships and collective community action even further.” It is in shared meanings and values that we see the influence of place identity. Protecting the water is important to community members. A shared sense of a common goal to protect something of value, and a common group identity can, and does, function to bring people together in joint group processes such as the SRDP. As is evident from the results in Chapters Four and Six, while the range of place-based values and factors shaping place identity is variable, there is a common thread expressed by many community members – that water is important for both the individual and collective good of community members, and is an important part of the social, emotional and cultural fabric. Though resignation to deal with changes is prevalent (see Section 7.2.4 above and Chapter Six), very few participants interviewed felt that the water should not be protected or fixed in some way. Key to the collective values is a sense of belonging to certain places (see Chapters Four and Six). This was evidenced in the quote from Lloyd Norn (pers. comm., 2011) in section 6.2.1.3 where he described what drives him to engage in stewardship and advocating for the protection of water. Engaging in group processes, where values and identity are reinforced, can serve to strengthen sense of belonging to not only places but the groups engaged in action. This can in turn result in greater commitment to place and willingness to engage at a collective level, thereby supporting adaptability.

Divergent place values do exist in Fort Resolution, as evidenced in the quote from Raymond Simon in Chapter Six, about teaching people the proper way to be on the water and that people's behaviours were starting to shift to using the land for the right reasons. However, divergent values seem more prevalent between community members and outsiders. Participants noted perceptions that the values of outside parties – particularly those with decision-making powers – do not always align with community values. This is best evidenced in the above discussion on equity. Participants perceive that outside decisions do not reflect the values and meanings they assign to places. As such, outside actors can be perceived as not having the same values for land and water that community members do. These perceived divergent values can potentially preclude collective action and collaboration, if common ground cannot be achieved. As Cheng et al., (2003) note, when place meanings between insiders and outsiders differ strongly or clash, this can create conflict and create or reinforce negative stereotypes (see also Davenport et al., 2007). Thus, a diversity in place-based values (or other types of values) can create a paralysis in action, or limit to social adaptation (Adger, et al., 2008). Understanding diversity in values, through an exploration of place-based values and meanings, creates the space to identify potential limits (Adger et al., 2008; O'Brien & Wolf, 2012), and to seek ways to bridge diverse values and meanings so as to move forward in the most suitable manner for the most people (Cheng et al., 2003; Manzo & Perkins, 2006; Fresque-Baxter & Armitage, 2012).

Collective values and shared identity can play the most critical role in creating space for collective action in the case of Fort Resolution. As noted above, tensions exist between cultural groups within the community, as well as family units (Wesche, 2009). Despite these tensions, people share a common love of water, and a common desire to protect it. Thus, relationships between people can be strengthened by recognizing and building on the shared importance of

water to community members and the common place values identified in Chapter Four. Common and shared values between ‘insiders’ and ‘outsiders’ can also serve to strengthen relationships and collaboration. As noted in Chapter Six, community members feel comfortable working with government and academic researchers who share the common goal of protecting the values of the Slave River (e.g., quotation from Patrick Simon, pers. comm., 2010; see section 6.2.2.1). Though those values may differ between people, the desire to protect the watershed is a common, potentially unifying thread.

Fostering increased adaptive capacity then, should come via recognition and inclusion of locally held collective values into environment/watershed planning efforts and development of locally appropriate adaptation strategies. As Adger (2003, p.388) notes, “the effectiveness of strategies for adapting to climate change depends on the social acceptability of options for adaptation.” Additionally, as noted earlier, how people understand and feel about their ‘places’ can influence how they engage in stewardship, planning and adaptation (Kaltenborn, 1998; Stedman, 2002; Manzo & Perkins, 2006). Therefore, considering locally held values in planning can ensure that acceptable options are chosen that consider the place identity, meanings and health and well-being of community members. Water management decisions and choices around adaptation options (at multiple levels) in Fort Resolution should consider the importance of heritage, social connections, health and well-being, identity, water is life, and functional and experiential attributes of place. Considering these locally-held values will contribute to local buy-in (Relph, 2008) which can ensure greater chances of success.

By exploring place based values – of all actors involved – it becomes possible to understand how people feel about different types of activities, management options or behaviours and the acceptability of these, and how different activities may impact the meanings

ascribed to places (Cheng, et al., 2003; Davenport & Anderson, 2005; Manzo & Perkins, 2006). This can in turn potentially help to frame participation (or lack thereof) in collective action processes and address conflicts (Cheng, et al., 2003), helping to disentangle where these ‘social limits’ occur, to aid in future planning and dispute resolution to bring stakeholders closer together in understanding.

Having connections with other people contributes to increased social capital, and networks that develop as a result of this create opportunities for linkages that can be drawn on in times of crisis or change (such as water change) (Adger, 2003; Relph, 2008). Places, and the meanings ascribed to them, create the space for people to come together, through collective values for protecting place. While there are challenges that influence social capital, and some differences in values and approaches to addressing water change, overall it seems that many of the water stewardship activities taking place in Fort Resolution build on a shared collective sense of the importance of protecting water. This collective, shared love of water brings many people together, both from inside the community and from outside the community, and creates networks and linkages to address watershed change, strengthening social capital in Fort Resolution. Strong social capital and linked networks of actors are critical for collective action, and ultimately strengthen adaptive capacity (Adger, 2003; Bodin, et al., 2006; Plummer & Armitage, 2012). Collective action is a critical component of being able to adapt effectively to environmental change (Adger, 2003). People in the community recognize that there are others, both inside and outside of the community, to draw upon to address tough problems impacting the water, and all things that rely on it. Building on tried and tested relationships, as well as newly emerging relationships, can continue to contribute to individual and collective good within the community.

### 7.3 Chapter Conclusion

Based on the theoretical relationships and empirical evidence presented throughout this dissertation, it becomes clear that place identity can indeed play a role in shaping adaptation (Chapter Six) and adaptive capacity (this Chapter) in a number of ways. Place identity can also be drawn upon to foster adaptive capacity for dealing with future change. Place identity can also be simultaneously shaped by dimensions of adaptive capacity. This demonstrates the iterative nature of the relationship between place identity and adaptive capacity – it is bidirectional and can be mutually reinforcing, as well as context specific.

Also, as expected, while place identity indeed plays a role in shaping adaptive capacity, dimensions (such as equity and inter-community social dynamics) other than place identity are also important factors. This further reinforces that adaptive capacity is nuanced, and examining how adaptive capacity is shaped and experienced from multiple perspectives is important for a robust understanding. Understanding the relationship between place identity and adaptive capacity and how such a relationship works in concert with other dimensions can help to ensure local values are considered in water resource decision-making and adaptation planning.

As noted in Chapter Two, adaptation and adaptive capacity are multi-dimensional (Adger & Vincent, 2005; Vincent, 2007). These dimensions which shape how and why people adapt to environmental change – and what they can draw on in times of future change – exist and interact with each other at multiple scales. Individual level adaptation decisions are embedded within broader institutional, cultural and social scales (Adger et al., 2005; Adger & Vincent, 2005; Vincent, 2007) and can have cascading effects upwards on higher scales. Simultaneously, decisions at broader scales can influence the ability of individual actors to adapt to real or perceived environmental change.



Given that there appears to be a linkage between place identity and adaptation and adaptive capacity in Fort Resolution – in terms of the choices people make to protect places that are fundamentally part of who they are, and the impacts to identity from place change – place identity and its requisite place-values should be considered as part of a multi-dimensional framing of adaptive capacity in the community. Thus, place identity appears to be a subjective dimension of adaptation and adaptive capacity, given its personal, interior and often intangible nature. It both shapes and is shaped by objective and subjective dimensions of adaptation and adaptive capacity, as well as those that exist in the interplay between the two.

It is important to note, however, that place identity is one dimension within a multi-dimensional landscape. Other forces, such as equity, social capital and access to resources also interact to shape the ability of community members in Fort Resolution to adapt to change. Furthermore, much like other dimensions the role and influence of place identity in shaping adaptive capacity is embedded within broader scales of influence. Thus, examining adaptive capacity from a values-based perspective (i.e., one that includes the role of place identity) highlights the importance of considering ‘scale’ (i.e., from the individual to the community, etc.) in assessment of the linkages between place identity and adaptive capacity. Though preliminary considerations of scale emerge throughout this dissertation, further research could further elucidate issues of scale with respect to how place identity shapes adaptive capacity. This, and additional future research considerations, are addressed in the next Chapter.

The ‘level of influence’ of place identity on dimensions of adaptation and adaptive capacity will vary from person to person, just as place identity and the ability to adapt vary from person to person. For example, some participants are actively engaging in place-protective behaviours to protect and maintain valued places. For others, the impacts of change on loved

places are seen as beyond the control of the community and are therefore met with resignation. This further demonstrates the complexity and nuance of both place identity and adaptive capacity, and the relationship between the two.

Thus, examining place identity in concert with other dimensions can support a richer understanding of how and why people make some of the choices they do, when dealing with community-identified exposure-sensitivities. Including place identity and related values in adaptation research can point to opportunities and challenges (e.g., social limits; *sensu* Adger et al., 2009) to foster adaptive capacity based on the identities and values of people most impacted by current and potential future change. This is consistent with the increased call for inclusion of subjective factors in adaptation research (e.g., Lorenzoni et al., 2000; Grothmann & Patt, 2005; O'Brien & Wolf, 2010; Kuruppu & Liverman, 2011; Wolf et al., 2013), including emphasis on understanding matters to people and how this is influenced by perceived change (e.g., O'Brien & Wolf, 2010; Wolf et al., 2013). This is also consistent with the community-driven, bottom-up approaches advocated by researchers and practitioners who draw upon frameworks like the CAVIAR model, which focuses on identifying exposure-sensitivities and adaptation strategies based on participants' lived experiences and identified areas of importance (e.g., Smit, Hovelsrud & Wandel, 2008; Smit et al., 2010; Berkes & Armitage, 2010). Thus, intersecting the values-based approach and CAVIAR framework can allow researchers and practitioners to explore how climate change and other drivers are perceived and experienced by community members, how those experiences are framed and filtered through connections and identification with place, and how place-related values can be better articulated and included in fostering adaptive capacity and crafting locally- and culturally appropriate plans for addressing change (*sensu* Relph, 2008).

## CHAPTER 8: CONCLUSIONS AND RECOMMENDATIONS

### 8.1 Overview of Dissertation

Subjective dimensions of adaptive capacity have often been underemphasized in environmental change research, but cited as a critical avenue for future research and policy (Lorenzoni et al., 2000; Grothmann & Patt, 2005; O'Brien & Wolf, 2010; Adger et al., 2013). O'Brien and Wolf (2010) argue for a values-based approach to adaptation assessment that considers subjective dimensions of environmental change, including what people value about places and how environmental change impacts those values. They assert that the addition and application of new literatures into the conceptualization of adaptive capacity is warranted (O'Brien & Wolf, 2010). Thus, in Chapter One, I posited place identity as a lens for examining subjective dimensions of adaptive capacity, using a values-based approach intersected with the CAVIAR framework. In this dissertation, place identity was revealed to influence and shape a number of adaptive capacity dimensions (including objective and subjective and ones that exist within the interplay between the two) in the community of Fort Resolution. The research also revealed that place identity is simultaneously shaped by various dimensions of adaptive capacity. Given the iterative relationships between place identity and other dimensions of adaptive capacity, place identity as a subjective dimension (and its role in shaping other dimensions and overall adaptation and adaptive capacity) is an important consideration in a multi-dimensional analysis of adaptation and adaptive capacity.

This dissertation set out to explore the relationship between place identity, water change and adaptive capacity. Chapter One identified and defined the rationale for this study, from theoretical and practical perspectives. From a theoretical perspective, as identified above,

subjective dimensions of adaptive capacity have received less attention and require further empirical investigation. From a practical perspective, the importance of values in water stewardship and decision-making was recognized in the NWT Water Stewardship Strategy (AANDC/GNWT, 2010). The examination of the relationship between place identity and adaptive capacity contributes to filling this gap in knowledge, and has practical implications, as will be further discussed in section 8.3. Chapter One also presented the research purpose and guiding objectives, which will be reprised in the subsequent section.

Chapter Two explored the antecedent place, place identity and adaptive capacity literatures. This chapter built the theoretical basis for assessing linkages between place identity and adaptive capacity. Both place identity and adaptive capacity were broken down into their component parts, or ‘constructs’ and ‘dimensions’. Establishing theoretical linkages between place identity and adaptive capacity drew on diverse disciplinary perspectives. In this Chapter, I also posited place identity as a specific subjective dimension of adaptive capacity.

Chapter Three presented the methodology that guided this research. In this Chapter, I first discussed my philosophical perspective, constructivism, and how this shaped choices in the research. I then discussed the methodological considerations for this research, including qualitative methodology and the case study as research strategy. I then advanced the conceptual framework (Figure 2) used to guide this study. Following this, I presented the key data collection methods and analysis strategy.

Chapter Four explored place-based relationships in Fort Resolution, and how place identity manifests in these relationships. People in Fort Resolution are strongly connected to land and water and to specific places in the Slave River watershed. In Fort Resolution, place-based relationships include connections to heritage, health and wellbeing, social experiences,

functional and experiential attributes, identity, and water as a life-giver. These connections reveal the manifestation of place identity, via specific constructs such as rootedness, sense of belonging, continuity and self-efficacy. Place – and more specifically, water and the ‘land’ – contribute to individual and collective place identity in Fort Resolution. People value the water and land and want it to remain continuous in order to maintain connections to valued attributes of place and to maintain place identity. People in Fort Resolution approach the concept of environment holistically, with water as a thread that connects all parts of the system. Thus, discussions throughout this dissertation reflect such interconnections and conversations about water reflect relationships to land, animals, etc., in tandem.

Chapter Five examined how community members have perceived, identified and experienced changes (or exposure-sensitivities) in the Slave River and Delta (and where applicable, other traditionally important waterways) and how water may be projected to change into the future. The expression of such exposure-sensitivities also revealed how such changes affect the ways in which people use the water and land in their day-to-day lives. A great deal of change to water, and important community places, has been observed by community members and this emerged as a paramount concern. For example, declining water levels are impacting access to treasured places, and impacting opportunities for connection to heritage and to other members of the community. This Chapter also provided a brief comment on the instrumental record, highlighting both convergences and divergences with community perceptions of change.

Chapter Six examined the impacts of community-identified changes on people in the community. Impacts of change were examined in two veins: through perceived impacts to place identity (including loss of rootedness, sense of belonging and security, among others) and through individual and collective responses (both real and desired) to community-identified

change. The identified responses range from individual reactive adaptations to more proactive strategies, including transmission of traditional knowledge, values and skills, and engagement in collective action processes.

Chapter Seven explored the relationship between place identity and adaptive capacity. This relationship was framed from a values perspective, consistent with the identified need for a values-based approach to adaptation assessment (e.g., O'Brien & Wolf, 2012), and drew on the empirical and theoretical foundations from previous Chapters, coupled with an analysis and assessment of dimensions of adaptive capacity. In this Chapter, I examined how place identity shaped, and was shaped by, the following dimensions of adaptation and adaptive capacity: multiple knowledge systems and learning, information, perceptions of capacity and equity, and social capital and collective action. This Chapter highlighted the emergent relationship between place identity and adaptive capacity in the community of Fort Resolution, and sets the stage for future research endeavours to unpack this relationship further.

In this concluding chapter I revisit the research objectives and draw conclusions for these objectives. I also summarize the theoretical and practical contributions of this research, as well as recommendations for future research and practice. Finally, I also briefly sketch out my personal experience of the research journey and reflect on relationships to place, and how my relationship to place has changed through the course of this research.

## **8.2 Revisiting Research Objectives**

The purpose of this dissertation was to **investigate the link between place identity and adaptation and adaptive capacity, in the context of relationships with water.** I have

addressed key gaps in the climate change literature regarding the role of subjective dimensions of adaptive capacity. The subjective attributes of adaptive capacity reflect an area of novel research, as the relationship between place identity and adaptive capacity has not been explored in detail or made explicit. There were three associated objectives that supported the purpose of the research, each with related sub-objectives.

The first objective was to examine the extent to which individual and collective place identity in Fort Resolution was connected to water (**Objective 1**). This objective aimed to identify the ways in which people are connected to and value both water generally and key places in the community's traditional territory specifically. Emphasis was on both individual and collective values and place identities. Objective One was achieved and addressed via results presented in Chapter Four, and to an extent continued via the explorations of impacts to place identity in Chapter Six. Many experiences emerged that shaped individual and collective identity in Fort Resolution, including connections to culture and heritage, the role of water and place in health and well-being including the idea of 'best self' (self-esteem and efficacy), the social connections that water and the land provide, and experiential attributes such as peace, perspective and freedom. It is evident that water and the land – and specific interactions and relationships with key places – are important for how people in Fort Resolution identify. In terms of collective values, although the meanings varied across participants, the value and importance of the water and land to people and their identities was transcendent. This points to a collective valuing of water and a collective place identity that is influenced by relationships with water and place.

The second objective to identify whether people had experienced changing water conditions and in what ways, and if so, whether community-identified changing water conditions

had impacted the place identity of community residents. There were two associated sub-objectives. The first was to determine what the community-identified exposure-sensitivities were, including current and future exposure-sensitivities, and how identified changes were attributed. This objective was addressed in Chapter Five, through exploration of community-identified changes to water. Community-identified concerns about declining water levels and that these changes felt drastic compared to past conditions in the watershed. Participants also expressed perceptions about declining water quality. Mistrust of water quality remains pervasive, and water should continue to be monitored and assessed in partnership with community members to increase trust in the findings. Overall, community members feel that the watershed is changing, and that the system is threatened by multiple intersecting drivers of change, both natural and anthropogenic. Attributions of cause, however, primarily centred on anthropogenic activities taking place outside of the community and without community involvement. Many participants identified concerns about the future of water (and the Slave River and Delta in particular), and how they feel it will continue to change and likely get worse. Many people in the community are scared that in the future, there will be less clean, useable water for their children and grandchildren. This translated into experiences of loss for many people and is providing some basis for engagement in different water stewardship initiatives in the community.

The second sub-objective associated with Objective 2 was to examine how community members felt that identified current or future changes shaped their relationships with water and the extent to which those relationships have influenced how they have perceived and dealt with change (risk perception and adaptation). This particular sub-objective was addressed partly in Chapter Five, with respect to exposure-sensitivities, and explored in greater depth in Chapter Six. Results and analysis revealed that participants are experiencing impacts to place identity



constructs, most notably, rootedness, sense of belonging, self-efficacy, security and continuity. The community-identified exposure-sensitivities in places that people identify with, coupled with impacts to place identity, are resulting in a range of adaptation responses and individual and collective levels. At an individual level, analysis revealed that there are differing levels of individual capacity to adapt, mistrust of water resulting in coping mechanisms, and some participants are engaging in individual place-protective behaviours. At a collective level, participants talked about the importance of, and engagement in, collaborative action both within the community and with external partners, and the importance of (re)connecting people (primarily younger generations) with water and traditional values and skills related to water and the land. Overall, the role of place identity, and impacts to place identity from community-identified changes, were shown to shape (in concert with other factors) the choices that people in the community made around adaptation.

The third research objective was to explore whether or not place identity may contribute to the ability of the community to cope with, address, moderate or seek opportunities in community-identified changes to water and important places (adaptive capacity). This was primarily explored in Chapter Seven, though Chapter Six highlighted the role of place identity in the adaptation strategies that people employ to deal with community-identified water changes. Chapter Seven built on theoretical and empirical foundations to tease out and discuss the nuanced relationships between place identity and adaptation and adaptive capacity. Given the relationships that people in the community have to water and place, the impacts to place identity from the identified changes, and the adaptation choices that people make to deal with those changes, it appears that place identity does indeed shape current adaptation and can influence dimensions of future adaptive capacity. Maintaining and fostering place identity, and protecting

places that regulate and give congruence to that identity, can support adaptive capacity to deal with future changes. The research also revealed that dimensions of adaptation and adaptive capacity can also in turn influence the manifestation and maintenance of place identity. As such, place identity and adaptive capacity can have a bidirectional, mutually reinforcing relationship.

The purpose of this dissertation was to explore the linkages between place identity, community-identified changes to water and adaptive capacity. It is evident through this research, and the results and analysis contained herein, that community members of Fort Resolution are deeply connected to the Slave River (and other important community waterways), and to ‘water’ broadly. Water is life, and it sustains all living things and the activities and needs that they rely upon for existence. With the changing conditions identified by the participants, it is increasingly difficult to maintain those values, uses and meanings of place that inform place identity, resulting in increasing frustration and potential for ongoing or heightened disconnection with place. With these changes however, many people are taking action to protect the places that are important to them.

An examination of the multiple dimensions that shape adaptive capacity, whether at individual or collective levels, can yield a more robust understanding of impacts of change and opportunities to address change. Analysis of adaptive capacity should emphasise both objective and subjective determinants, and the interplay between the two. Additionally, consideration of how dimensions interact with and shape each other is paramount. This research revealed that place identity can be considered a subjective dimension of adaptive capacity, and that examining adaptive capacity through a place-based lens can yield important insights (see Chapter Seven). Understanding how people relate to and identify with places, and how these relationships influence adaptation, can help to identify opportunities for building place-based solutions and

collective action situations to address current and future environmental change, particularly with respect to water as in the case of Fort Resolution. People see the world differently and perceptions and experiences of impacts will depend on what it is people value (O'Brien & Wolf, 2010). As such, climate change and other drivers cannot be responded to with a one-size-fits all solution for people and places (O'Brien & Wolf, 2010). Examining place-based values – through an investigation of place identity, and how these values shape adaptive capacity – can help to identify and implement locally-appropriate solutions or coping strategies (e.g., community-driven monitoring programs that use indicators based on community-identified values and focus on valued places; youth-Elder land-based camps; stewardship and/or climate change programs or policies that protect places that reinforce or maintain identity and values; identity and values-based community visioning processes for local watershed management, etc.) that consider place-based values and that achieve more buy-in and support. It is also important, however, for planning processes to explore and consider how naturally occurring changes are accounted for in development of local solutions, particularly when such changes are seen as threatening or impactful to maintenance of livelihood and identity.

### **8.3 Research Contributions and Recommendations**

#### ***8.3.1 Theoretical Contributions***

The major theoretical contribution of this research was identifying the relationship between place identity and adaptive capacity, through a detailed empirical examination of how place identity shapes adaptive capacity in the community of Fort Resolution. This research has shown that, in Fort Resolution, there is a relationship between how people identify with a place and how such place-identification shapes and interacts with dimensions of adaptation and

adaptive capacity – and vice versa. Thus, it is critical to understand place identity when undertaking adaptation assessments, as it can be an important factor in shaping how and why people adapt. As this is an area that has seen limited systematic investigation, this research contributes to the climate change literature (as well as other perspectives that address adaptation and adaptive capacity, see Chapter Two) and offers new insights into what shapes how and why people adapt to real or perceived environmental change, using place identity as an entrée. Additionally, given the bidirectional relationship between place identity and adaptive capacity identified in Chapter 7, this dissertation can also contribute to the place and place identity literatures, through understanding of how adapting to environmental change may influence how people feel about places and themselves.

Through this contribution of understanding the place identity-adaptive capacity nexus, this research has also contributed to an expansion of the suite of theoretical approaches to, and understandings of, subjective adaptive capacity. As identified in Chapters One and Two, the rationale for undertaking this research was the gap in the adaptation literature regarding the ‘subjective’ dimensions of adaptive capacity (Lorenzoni et al., 2000; Grothmann & Patt, 2005; O’Brien & Wolf, 2010). Extensive work has been conducted on exploring and identifying objective attributes of adaptive capacity, and the dimensions that shape how people cope with, moderate and anticipate future environmental changes (see for example, Yohe & Tol, 2002; Grothmann & Patt, 2005). In concert with objective dimensions, subjective dimensions have been suggested to play a critical role in how people relate to and characterize climate change and impacts from other drivers, and understand and make choices amongst adaptation behaviours (Lorenzoni, et al., 2000; Wester-Herber, 2004; Grothmann & Patt, 2005; Kuruppu, 2009; O’Brien & Wolf, 2010). This research thus highlights the importance of conceptualizing place

identity, as a subjective attribute of adaptive capacity, as an important consideration for robust, multi-dimensional analyses of adaptation and adaptive capacity (see Chapter Seven), particularly those that employ values-based approaches (*sensu* O'Brien & Wolf).

### ***8.3.2 Methodological Contributions***

From a methodological standpoint, this research developed a novel approach for incorporating youth into environmental research in a meaningful way, through linking of participatory research methods with classroom-based education. Often in environmental research, youth are not considered as co-producers of environmental change knowledge in the same way that others in the community may be. Elders and land users have longer-term experiential knowledge of change and a greater degree of traditional knowledge, but youth also have an important role to play in environmental change research. Indeed, it is common in Fort Resolution, and the NWT as a whole, for Elders and community members to advocate for greater youth engagement in environmental stewardship and research (Participant Observation, Author, 2013-2014). As future scientists, advocates and community leaders, their experiences, values and ideas should be considered and encouraged in the research process. Involving youth in participatory research in the classroom not only creates the space for youth to be involved, but provides a nexus between the research community and the northern education system (Fresque-Baxter, 2013; see also Chapter Three). Future research could continue to explore northern youth place identities, and linkages between youth concerns and experiences and policy development. Engaging youth in environmental research creates opportunities for them to learn from researchers and be exposed to a range of information that can be useful in their future roles, regardless of what those are.

### ***8.3.3 Practical Contributions***

At a practical level, this dissertation also provides insights for practitioners and policy-makers, both in the North and more broadly. Policy-makers should seek to understand the meanings people ascribe to places and how change impacts these meanings, and incorporate these into decisions that impact the local level. For example, siting of industrial developments (e.g., mines) could consider not only the biophysical effects of proposed activities but how development could potentially impact important place values and place identity of local residents. This could potentially lead to (re)location of proposed developments to areas that are less fundamental to identity and well-being. Recognizing those values, and working with community members to ensure those values are accounted for in decision-making about development (beyond tokenism), can contribute to stakeholder buy-in.

Climate change adaptation assessments, at the local level, should include understandings of place identity when assessing the adaptation strategies and adaptive capacity of communities. Additionally, development of short and long term climate change adaptation plans should take into consideration place-based values and how climate change might impact these values (O'Brien & Wolf, 2010; Wolf et al., 2013). Understanding how climate change affects people emotionally, through loss of valued places, is important for developing effective strategies and outreach mechanisms for those potentially most affected (Wester-Herber, 2004; Fresque-Baxter & Armitage, 2012). Starting with what matters to people and why (through understanding how values are assigned to place and how they inform self-conception) should be an integral part to adaptation assessments and development of requisite plans. Linking these emotional and subjective aspects of climate change with physical and cultural aspects contributes to well-rounded, successful climate adaptation planning.

The information contained within this dissertation can contribute to community use and decision-making in a few different ways. One key aspect is the documentation of stories and experiences from Elders and land users. Increasingly, the experience and wisdom of Elders is being lost, and there is an impetus to ensure their stories are recorded and available within their communities. In the case of this research, the dissertation, as well as transcripts and audio recordings will be archived in the community for their use.<sup>35</sup> In light of potential future changes, including climate- or development-driven changes, synthesised information from both Elders and land users may be useful to the community in local decision-making.

#### ***8.3.4 Future Research***

Building on the above theoretical and practical contributions, avenues for future research can be identified. Future research can expand on the results presented in this dissertation, and further contribute to the literature on subjective adaptive capacity.

While findings of this research are localized to the Fort Resolution experience, the lessons learned can be extrapolated to other similar places. Experiences in smaller, remote communities that are located on or near important community water resources, and that still have high degrees of subsistence lifestyles, will likely be similar to those documented here. As the goal of this dissertation was to examine place identity and adaptive capacity in one small, strongly place-connected community, future research could expand on and explore the framework in other communities of varying sizes, compositions and locations. For example,

---

<sup>35</sup> Note: All information is protected by confidentiality and access use agreements. As indicated in the WLU consent forms and DKFN research agreement, participant information (transcripts, recordings, etc.) cannot be used without participant permission.

research in an urban context, as a comparison to remote and isolated communities, would yield interesting and informative insights into the relationship between place identity and adaptive capacity in multiple contexts. Additionally, research has focused on experiences of Indigenous peoples in places, and related sense of place and place identity (e.g., Wilson, 2003; Windsor & Mcvey, 2005, etc.). In this research, given the importance of Traditional and local knowledge, culture, and passing down of traditional values in shaping place identity for many people in the community (see Chapter 4), there may be a particular ‘Indigenous place identity’ or ‘Indigenous sense of place’ that researchers/practitioners should be aware of when engaged in research/practice related to person-place bonds, as well as work on adaptive capacity. The role of such a specific place identity or sense of place (and how it interacts with other aspects of identity and the forces that shape identity), and its relationship to adaptation and adaptive capacity across different communities and contexts represents a potential future avenue of research.

In this research, I made the choice to ground my theoretical and empirical framing within the climate change literature, with emphasis on the use of the values-based approach and CAVIAR frameworks. The rationale for this choice was discussed in Chapters One and Two, and was appropriate for context and approach of this research. Generic dimensions of adaptive capacity were gleaned from varying perspectives. Future research on place identity and adaptive capacity could be grounded within other perspectives, and could yield interesting insights.

As identified in Chapter Seven, conflicting values – including place-based values of insiders versus outsiders, for example – can create a barrier to collective action. Further research, in Fort Resolution or similar contexts, should build on these findings and explore how to create the space for values to come together or to be negotiated by multiple stakeholders. Recent work on the concept of ‘knowledge co-production’ in governance and resource management (see for



example, Berkes & Armitage, 2010; Raymond et al., 2010; Rogers & Weber, 2010; Armitage et al., 2011; Taylor et al., 2012), and an exploration of how place-based values can feed into this, represents a novel avenue for future research on the place identity-adaptive capacity nexus.

Additional research into place and identity has provided insights into the role of power, control and access on shaping place-based relationships (e.g., Sibley, 1995; Dixon & Durrheim, 2000). Issues of equity emerged in this research related to actions and decision-making undertaken by outside actors (e.g., government and industry) (see Chapters Six and Seven). The role of power and other enabling factors in shaping whose values are included in discussions of stewardship, and how those values are prioritized, could yield useful insights for watershed management and adaptation planning (O'Brien & Wolf, 2010).

The concept of 'scale' in place identity was briefly touched upon (see Chapters Four, Six and Seven). Ongoing research is examining the formation of place connections from further afield, as influenced by globalization, connectivity and mobility (Massey, 1997; Gustafson, 2001; Lewicka, 2008). Explicitly exploring how globalization, connectivity and mobility (from a place identity perspective) influence adaptive capacity, warrants further scholarly investigation.

Finally, sharing of traditional values, skills and knowledge emerged as an opportunity to reconnect people with the water and land could instil traditional values and stewardship ethics in younger generations (see Chapter Seven). Connecting people with the water and land can also provide a mechanism for maintaining, fostering and/or establishing place identity. Future research could explore the viability of different mechanisms for connecting people to the land (e.g., culture camps, trapper education programs), and how this influences place identity. Such

future research could also examine how fostering place identity through land-based programs can improve or foster adaptive capacity.

#### **8.4 Reflecting on my Personal Research Journey**

Engaging in research about place – or more specifically, love of place – is an interesting endeavour. Whether intentionally or subconsciously, it forces you to think about your own views on ‘place(s)’, including the places that matter to you. I knew going into this research that I hold a deep love of water, and that whenever I am near water I am my happiest, healthiest self. Being out in the bush or on the water is the only place where I can completely let go, quell my anxiety and just *live*. It was these experiences that drew me to the concepts of person-place bonds and place identity. I wanted to explore how those relationships formed and how they were shaped by change, and what people did to protect or adapt to places when they changed. What I was not prepared for was how engaging in this research would change me, and the truly profound impact it would have on my life – and *my* place identity.

Fort Resolution has become a second home to me. From watching the sunrise over Great Slave Lake, to cruising the Delta, to playing cards on a cold and frosty winter’s night, it is a place that is now intimately part of my identity. Though there are many places I have hung my hat over the years – Ottawa, St. Catharines, Fredericton, Waterloo, and Yellowknife – there are only a few places I carry with me as ‘home’ places. My home places, the places that have shaped me most profoundly, and that I identify and express as home are Ottawa and Fort Resolution. These are the places where my family are and where I return to when I need to connect to myself.

## 8.5 Conclusion

The relationships and connections that people have with place(s) are immensely powerful. Exploring the connections people have with place is enlightening, challenging, informing and tinged with the sadness of loss, all at the same time. Understanding the relationships people have with place can help academics, communities, practitioners and policy-makers make better-informed choices about water stewardship, watershed management and adaptation planning. Embedding place-based values into management and planning – particularly for adaptation planning – can ensure we are making decisions that meet the needs of local people and local place, where the impacts of environmental change are most intimately felt.

I return now to the poem used in the opening lines of Chapter One. As noted, Silverstein's (1974) poem has always held deep meaning for me. The poem represented the beginning of a journey that would ultimately become this dissertation – and shape it – many years later. This dissertation, and my experiences in Fort Resolution, and in the NWT as a whole, have changed me and my own concept of place identity. To have had the opportunity to deeply explore the richness associated with places, and the relationships that people have with places, has been an immensely rewarding experience.

Currently, my sidewalk ends in the NWT, working on issues related to water stewardship and community-capacity building. But as we know from Silverstein's (1974) poem, the end of the sidewalk is really an idealized place. The end of the sidewalk can be anywhere, at any time, and anything we want it to be – much like the places that develop and mediate our identity. So for now, the sidewalk ends here, but I look forward to the next part of the journey – the next '*place where the sidewalk ends*' (Silverstein, 1974, p. 64).

## APPENDIX A – License Agreement from John Wiley and Sons for Text Extracts in Chapter 2

### JOHN WILEY AND SONS LICENSE TERMS AND CONDITIONS

Dec 09, 2014

---

---

This is a License Agreement between Jennifer Fresque-Baxter ("You") and John Wiley and Sons ("John Wiley and Sons") provided by Copyright Clearance Center ("CCC"). The license consists of your order details, the terms and conditions provided by John Wiley and Sons, and the payment terms and conditions.

**All payments must be made in full to CCC. For payment instructions, please see information listed at the bottom of this form.**

License Number	3524291175899
License date	Dec 08, 2014
Licensed content publisher	John Wiley and Sons
Licensed content publication	Wiley Interdisciplinary Reviews: Climate Change
Licensed content title	Place identity and climate change adaptation: a synthesis and framework for understanding
Licensed copyright line	Copyright © 2012 John Wiley & Sons, Ltd.
Licensed content author	Jennifer A. Fresque-Baxter, Derek Armitage
Licensed content date	Mar 22, 2012
Start page	251
End page	266
Type of use	Dissertation/Thesis
Requestor type	Author of this Wiley article
Format	Print and electronic
Portion	Text extract
Number of Pages	7
Will you be translating?	No
Title of your thesis / dissertation	'WATER IS LIFE': EXPLORING THE RELATIONSHIP BETWEEN PLACE IDENTITY, WATER AND ADAPTIVE CAPACITY IN FORT RESOLUTION, NORTHWEST TERRITORIES, CANADA
Expected completion date	Dec 2014
Expected size (number of pages)	375
Total	0.00 CAD
Terms and Conditions	

## TERMS AND CONDITIONS

This copyrighted material is owned by or exclusively licensed to John Wiley & Sons, Inc. or one of its group companies (each a "Wiley Company") or handled on behalf of a society with which a Wiley Company has exclusive publishing rights in relation to a particular work (collectively "WILEY"). By clicking  accept  in connection with completing this licensing transaction, you agree that the following terms and conditions apply to this transaction (along with the billing and payment terms and conditions established by the Copyright Clearance Center Inc., ("CCC's Billing and Payment terms and conditions"), at the time that you opened your Rightslink account (these are available at any time at <http://myaccount.copyright.com>).

### Terms and Conditions

- The materials you have requested permission to reproduce or reuse (the "Wiley Materials") are protected by copyright.
- You are hereby granted a personal, non-exclusive, non-sub licensable (on a stand-alone basis), non-transferable, worldwide, limited license to reproduce the Wiley Materials for the purpose specified in the licensing process. This license is for a one-time use only and limited to any maximum distribution number specified in the license. The first instance of republication or reuse granted by this licence must be completed within two years of the date of the grant of this licence (although copies prepared before the end date may be distributed thereafter). The Wiley Materials shall not be used in any other manner or for any other purpose, beyond what is granted in the license. Permission is granted subject to an appropriate acknowledgement given to the author, title of the material/book/journal and the publisher. You shall also duplicate the copyright notice that appears in the Wiley publication in your use of the Wiley Material. Permission is also granted on the understanding that nowhere in the text is a previously published source acknowledged for all or part of this Wiley Material. Any third party content is expressly excluded from this permission.
- With respect to the Wiley Materials, all rights are reserved. Except as expressly granted by the terms of the license, no part of the Wiley Materials may be copied, modified, adapted (except for minor reformatting required by the new Publication), translated, reproduced, transferred or distributed, in any form or by any means, and no derivative works may be made based on the Wiley Materials without the prior permission of the respective copyright owner. You may not alter, remove or suppress in any manner any copyright, trademark or other notices displayed by the Wiley Materials. You may not license, rent, sell, loan, lease,

pledge, offer as security, transfer or assign the Wiley Materials on a stand-alone basis, or any of the rights granted to you hereunder to any other person.

- The Wiley Materials and all of the intellectual property rights therein shall at all times remain the exclusive property of John Wiley & Sons Inc, the Wiley Companies, or their respective licensors, and your interest therein is only that of having possession of and the right to reproduce the Wiley Materials pursuant to Section 2 herein during the continuance of this Agreement. You agree that you own no right, title or interest in or to the Wiley Materials or any of the intellectual property rights therein. You shall have no rights hereunder other than the license as provided for above in Section 2. No right, license or interest to any trademark, trade name, service mark or other branding ("Marks") of WILEY or its licensors is granted hereunder, and you agree that you shall not assert any such right, license or interest with respect thereto.
- NEITHER WILEY NOR ITS LICENSORS MAKES ANY WARRANTY OR REPRESENTATION OF ANY KIND TO YOU OR ANY THIRD PARTY, EXPRESS, IMPLIED OR STATUTORY, WITH RESPECT TO THE MATERIALS OR THE ACCURACY OF ANY INFORMATION CONTAINED IN THE MATERIALS, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY, ACCURACY, SATISFACTORY QUALITY, FITNESS FOR A PARTICULAR PURPOSE, USABILITY, INTEGRATION OR NON-INFRINGEMENT AND ALL SUCH WARRANTIES ARE HEREBY EXCLUDED BY WILEY AND ITS LICENSORS AND WAIVED BY YOU
- WILEY shall have the right to terminate this Agreement immediately upon breach of this Agreement by you.
- You shall indemnify, defend and hold harmless WILEY, its Licensors and their respective directors, officers, agents and employees, from and against any actual or threatened claims, demands, causes of action or proceedings arising from any breach of this Agreement by you.
- IN NO EVENT SHALL WILEY OR ITS LICENSORS BE LIABLE TO YOU OR ANY OTHER PARTY OR ANY OTHER PERSON OR ENTITY FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, INDIRECT, EXEMPLARY OR PUNITIVE DAMAGES, HOWEVER CAUSED, ARISING OUT OF OR IN CONNECTION WITH THE DOWNLOADING, PROVISIONING, VIEWING OR USE OF THE MATERIALS REGARDLESS OF THE FORM OF ACTION, WHETHER FOR BREACH OF CONTRACT, BREACH OF WARRANTY, TORT, NEGLIGENCE, INFRINGEMENT OR OTHERWISE (INCLUDING, WITHOUT LIMITATION, DAMAGES BASED ON LOSS OF PROFITS, DATA, FILES, USE, BUSINESS OPPORTUNITY OR CLAIMS OF THIRD PARTIES), AND WHETHER OR NOT THE PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THIS LIMITATION SHALL APPLY NOTWITHSTANDING ANY FAILURE OF ESSENTIAL PURPOSE OF ANY LIMITED REMEDY PROVIDED HEREIN.

- Should any provision of this Agreement be held by a court of competent jurisdiction to be illegal, invalid, or unenforceable, that provision shall be deemed amended to achieve as nearly as possible the same economic effect as the original provision, and the legality, validity and enforceability of the remaining provisions of this Agreement shall not be affected or impaired thereby.
- The failure of either party to enforce any term or condition of this Agreement shall not constitute a waiver of either party's right to enforce each and every term and condition of this Agreement. No breach under this agreement shall be deemed waived or excused by either party unless such waiver or consent is in writing signed by the party granting such waiver or consent. The waiver by or consent of a party to a breach of any provision of this Agreement shall not operate or be construed as a waiver of or consent to any other or subsequent breach by such other party.
- This Agreement may not be assigned (including by operation of law or otherwise) by you without WILEY's prior written consent.
- Any fee required for this permission shall be non-refundable after thirty (30) days from receipt by the CCC.
- These terms and conditions together with CCC's Billing and Payment terms and conditions (which are incorporated herein) form the entire agreement between you and WILEY concerning this licensing transaction and (in the absence of fraud) supersedes all prior agreements and representations of the parties, oral or written. This Agreement may not be amended except in writing signed by both parties. This Agreement shall be binding upon and inure to the benefit of the parties' successors, legal representatives, and authorized assigns.
- In the event of any conflict between your obligations established by these terms and conditions and those established by CCC's Billing and Payment terms and conditions, these terms and conditions shall prevail.
- WILEY expressly reserves all rights not specifically granted in the combination of (i) the license details provided by you and accepted in the course of this licensing transaction, (ii) these terms and conditions and (iii) CCC's Billing and Payment terms and conditions.
- This Agreement will be void if the Type of Use, Format, Circulation, or Requestor Type was misrepresented during the licensing process.
- This Agreement shall be governed by and construed in accordance with the laws of the State of New York, USA, without regards to such state's conflict of law rules. Any legal action, suit or proceeding arising out of or relating to these Terms and Conditions or the breach thereof shall be instituted in a court of competent jurisdiction in New York County in the State of New York in the United States of

America and each party hereby consents and submits to the personal jurisdiction of such court, waives any objection to venue in such court and consents to service of process by registered or certified mail, return receipt requested, at the last known address of such party.

## **WILEY OPEN ACCESS TERMS AND CONDITIONS**

Wiley Publishes Open Access Articles in fully Open Access Journals and in Subscription journals offering Online Open. Although most of the fully Open Access journals publish open access articles under the terms of the Creative Commons Attribution (CC BY) License only, the subscription journals and a few of the Open Access Journals offer a choice of Creative Commons Licenses:: Creative Commons Attribution (CC-BY) license [Creative Commons Attribution Non-Commercial \(CC-BY-NC\) license](#) and [Creative Commons Attribution Non-Commercial-NoDerivs \(CC-BY-NC-ND\) License](#). The license type is clearly identified on the article.

Copyright in any research article in a journal published as Open Access under a Creative Commons License is retained by the author(s). Authors grant Wiley a license to publish the article and identify itself as the original publisher. Authors also grant any third party the right to use the article freely as long as its integrity is maintained and its original authors, citation details and publisher are identified as follows: [Title of Article/Author/Journal Title and Volume/Issue. Copyright (c) [year] [copyright owner as specified in the Journal]. Links to the final article on Wiley's website are encouraged where applicable.

### **The Creative Commons Attribution License**

The [Creative Commons Attribution License \(CC-BY\)](#) allows users to copy, distribute and transmit an article, adapt the article and make commercial use of the article. The CC-BY license permits commercial and non-commercial re-use of an open access article, as long as the author is properly attributed.

The Creative Commons Attribution License does not affect the moral rights of authors, including without limitation the right not to have their work subjected to derogatory treatment. It also does not affect any other rights held by authors or third parties in the article, including without limitation the rights of privacy and publicity. Use of the article must not assert or imply, whether implicitly or explicitly, any connection with, endorsement or sponsorship of such use by the author, publisher or any other party associated with the article.

For any reuse or distribution, users must include the copyright notice and make clear to others that the article is made available under a Creative Commons Attribution license, linking to the relevant Creative Commons web page.



To the fullest extent permitted by applicable law, the article is made available as is and without representation or warranties of any kind whether express, implied, statutory or otherwise and including, without limitation, warranties of title, merchantability, fitness for a particular purpose, non-infringement, absence of defects, accuracy, or the presence or absence of errors.

### **Creative Commons Attribution Non-Commercial License**

The [Creative Commons Attribution Non-Commercial \(CC-BY-NC\) License](#) permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.(see below)

### **Creative Commons Attribution-Non-Commercial-NoDerivs License**

The [Creative Commons Attribution Non-Commercial-NoDerivs License](#) (CC-BY-NC-ND) permits use, distribution and reproduction in any medium, provided the original work is properly cited, is not used for commercial purposes and no modifications or adaptations are made. (see below)

### **Use by non-commercial users**

For non-commercial and non-promotional purposes, individual users may access, download, copy, display and redistribute to colleagues Wiley Open Access articles, as well as adapt, translate, text- and data-mine the content subject to the following conditions:

- The authors' moral rights are not compromised. These rights include the right of "paternity" (also known as "attribution" - the right for the author to be identified as such) and "integrity" (the right for the author not to have the work altered in such a way that the author's reputation or integrity may be impugned).
- Where content in the article is identified as belonging to a third party, it is the obligation of the user to ensure that any reuse complies with the copyright policies of the owner of that content.
- If article content is copied, downloaded or otherwise reused for non-commercial research and education purposes, a link to the appropriate bibliographic citation (authors, journal, article title, volume, issue, page numbers, DOI and the link to the definitive published version on **Wiley Online Library**) should be maintained. Copyright notices and disclaimers must not be deleted.
- Any translations, for which a prior translation agreement with Wiley has not been agreed, must prominently display the statement: "This is an unofficial translation of

an article that appeared in a Wiley publication. The publisher has not endorsed this translation."

### **Use by commercial "for-profit" organisations**

Use of Wiley Open Access articles for commercial, promotional, or marketing purposes requires further explicit permission from Wiley and will be subject to a fee. Commercial purposes include:

- Copying or downloading of articles, or linking to such articles for further redistribution, sale or licensing;
- Copying, downloading or posting by a site or service that incorporates advertising with such content;
- The inclusion or incorporation of article content in other works or services (other than normal quotations with an appropriate citation) that is then available for sale or licensing, for a fee (for example, a compilation produced for marketing purposes, inclusion in a sales pack)
- Use of article content (other than normal quotations with appropriate citation) by for-profit organisations for promotional purposes
- Linking to article content in e-mails redistributed for promotional, marketing or educational purposes;
- Use for the purposes of monetary reward by means of sale, resale, licence, loan, transfer or other form of commercial exploitation such as marketing products
- Print reprints of Wiley Open Access articles can be purchased from:  
[corporatesales@wiley.com](mailto:corporatesales@wiley.com)

Further details can be found on Wiley Online Library  
<http://olabout.wiley.com/WileyCDA/Section/id-410895.html>

Other Terms and Conditions:

**v1.9**

**Questions? [customercare@copyright.com](mailto:customercare@copyright.com) or +1-855-239-3415 (toll free in the US) or +1-978-646-2777.**

**Gratis licenses (referencing \$0 in the Total field) are free. Please retain this printable license for your reference. No payment is required.**

---

---

## APPENDIX B – License Agreement from John Wiley and Sons for Table in Chapter 2

### JOHN WILEY AND SONS LICENSE TERMS AND CONDITIONS

Dec 09, 2014

---

---

This is a License Agreement between Jennifer Fresque-Baxter ("You") and John Wiley and Sons ("John Wiley and Sons") provided by Copyright Clearance Center ("CCC"). The license consists of your order details, the terms and conditions provided by John Wiley and Sons, and the payment terms and conditions.

**All payments must be made in full to CCC. For payment instructions, please see information listed at the bottom of this form.**

License Number	3524290470642
License date	Dec 08, 2014
Licensed content publisher	John Wiley and Sons
Licensed content publication	Wiley Interdisciplinary Reviews: Climate Change
Licensed content title	Place identity and climate change adaptation: a synthesis and framework for understanding
Licensed copyright line	Copyright © 2012 John Wiley & Sons, Ltd.
Licensed content author	Jennifer A. Fresque-Baxter, Derek Armitage
Licensed content date	Mar 22, 2012
Start page	251
End page	266
Type of use	Dissertation/Thesis
Requestor type	Author of this Wiley article
Format	Print and electronic
Portion	Figure/table
Number of figures/tables	1
Original Wiley figure/table number(s)	Table 1 - 'Place identity subdimensions'
Will you be translating?	No
Title of your thesis / dissertation	'WATER IS LIFE': EXPLORING THE RELATIONSHIP BETWEEN PLACE IDENTITY, WATER AND ADAPTIVE CAPACITY IN FORT RESOLUTION, NORTHWEST TERRITORIES, CANADA
Expected completion date	Dec 2014
Expected size (number of pages)	375

Total

0.00 CAD

[Terms and Conditions](#)

## TERMS AND CONDITIONS

This copyrighted material is owned by or exclusively licensed to John Wiley & Sons, Inc. or one of its group companies (each a "Wiley Company") or handled on behalf of a society with which a Wiley Company has exclusive publishing rights in relation to a particular work (collectively "WILEY"). By clicking  accept  in connection with completing this licensing transaction, you agree that the following terms and conditions apply to this transaction (along with the billing and payment terms and conditions established by the Copyright Clearance Center Inc., ("CCC's Billing and Payment terms and conditions"), at the time that you opened your Rightslink account (these are available at any time at <http://myaccount.copyright.com>).

### Terms and Conditions

- The materials you have requested permission to reproduce or reuse (the "Wiley Materials") are protected by copyright.
- You are hereby granted a personal, non-exclusive, non-sub licensable (on a stand-alone basis), non-transferable, worldwide, limited license to reproduce the Wiley Materials for the purpose specified in the licensing process. This license is for a one-time use only and limited to any maximum distribution number specified in the license. The first instance of republication or reuse granted by this licence must be completed within two years of the date of the grant of this licence (although copies prepared before the end date may be distributed thereafter). The Wiley Materials shall not be used in any other manner or for any other purpose, beyond what is granted in the license. Permission is granted subject to an appropriate acknowledgement given to the author, title of the material/book/journal and the publisher. You shall also duplicate the copyright notice that appears in the Wiley publication in your use of the Wiley Material. Permission is also granted on the understanding that nowhere in the text is a previously published source acknowledged for all or part of this Wiley Material. Any third party content is expressly excluded from this permission.
- With respect to the Wiley Materials, all rights are reserved. Except as expressly granted by the terms of the license, no part of the Wiley Materials may be copied, modified, adapted (except for minor reformatting required by the new Publication), translated, reproduced, transferred or distributed, in any form or by any means, and no derivative works may be made based on the Wiley Materials without the prior permission of the respective copyright owner. You may not alter, remove or suppress in any manner any copyright, trademark or other notices

displayed by the Wiley Materials. You may not license, rent, sell, loan, lease, pledge, offer as security, transfer or assign the Wiley Materials on a stand-alone basis, or any of the rights granted to you hereunder to any other person.

- The Wiley Materials and all of the intellectual property rights therein shall at all times remain the exclusive property of John Wiley & Sons Inc, the Wiley Companies, or their respective licensors, and your interest therein is only that of having possession of and the right to reproduce the Wiley Materials pursuant to Section 2 herein during the continuance of this Agreement. You agree that you own no right, title or interest in or to the Wiley Materials or any of the intellectual property rights therein. You shall have no rights hereunder other than the license as provided for above in Section 2. No right, license or interest to any trademark, trade name, service mark or other branding ("Marks") of WILEY or its licensors is granted hereunder, and you agree that you shall not assert any such right, license or interest with respect thereto.
- NEITHER WILEY NOR ITS LICENSORS MAKES ANY WARRANTY OR REPRESENTATION OF ANY KIND TO YOU OR ANY THIRD PARTY, EXPRESS, IMPLIED OR STATUTORY, WITH RESPECT TO THE MATERIALS OR THE ACCURACY OF ANY INFORMATION CONTAINED IN THE MATERIALS, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY, ACCURACY, SATISFACTORY QUALITY, FITNESS FOR A PARTICULAR PURPOSE, USABILITY, INTEGRATION OR NON-INFRINGEMENT AND ALL SUCH WARRANTIES ARE HEREBY EXCLUDED BY WILEY AND ITS LICENSORS AND WAIVED BY YOU
- WILEY shall have the right to terminate this Agreement immediately upon breach of this Agreement by you.
- You shall indemnify, defend and hold harmless WILEY, its Licensors and their respective directors, officers, agents and employees, from and against any actual or threatened claims, demands, causes of action or proceedings arising from any breach of this Agreement by you.
- IN NO EVENT SHALL WILEY OR ITS LICENSORS BE LIABLE TO YOU OR ANY OTHER PARTY OR ANY OTHER PERSON OR ENTITY FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, INDIRECT, EXEMPLARY OR PUNITIVE DAMAGES, HOWEVER CAUSED, ARISING OUT OF OR IN CONNECTION WITH THE DOWNLOADING, PROVISIONING, VIEWING OR USE OF THE MATERIALS REGARDLESS OF THE FORM OF ACTION, WHETHER FOR BREACH OF CONTRACT, BREACH OF WARRANTY, TORT, NEGLIGENCE, INFRINGEMENT OR OTHERWISE (INCLUDING, WITHOUT LIMITATION, DAMAGES BASED ON LOSS OF PROFITS, DATA, FILES, USE, BUSINESS OPPORTUNITY OR CLAIMS OF THIRD PARTIES), AND WHETHER OR NOT THE PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THIS LIMITATION SHALL APPLY

NOTWITHSTANDING ANY FAILURE OF ESSENTIAL PURPOSE OF ANY LIMITED REMEDY PROVIDED HEREIN.

- Should any provision of this Agreement be held by a court of competent jurisdiction to be illegal, invalid, or unenforceable, that provision shall be deemed amended to achieve as nearly as possible the same economic effect as the original provision, and the legality, validity and enforceability of the remaining provisions of this Agreement shall not be affected or impaired thereby.
- The failure of either party to enforce any term or condition of this Agreement shall not constitute a waiver of either party's right to enforce each and every term and condition of this Agreement. No breach under this agreement shall be deemed waived or excused by either party unless such waiver or consent is in writing signed by the party granting such waiver or consent. The waiver by or consent of a party to a breach of any provision of this Agreement shall not operate or be construed as a waiver of or consent to any other or subsequent breach by such other party.
- This Agreement may not be assigned (including by operation of law or otherwise) by you without WILEY's prior written consent.
- Any fee required for this permission shall be non-refundable after thirty (30) days from receipt by the CCC.
- These terms and conditions together with CCC's Billing and Payment terms and conditions (which are incorporated herein) form the entire agreement between you and WILEY concerning this licensing transaction and (in the absence of fraud) supersedes all prior agreements and representations of the parties, oral or written. This Agreement may not be amended except in writing signed by both parties. This Agreement shall be binding upon and inure to the benefit of the parties' successors, legal representatives, and authorized assigns.
- In the event of any conflict between your obligations established by these terms and conditions and those established by CCC's Billing and Payment terms and conditions, these terms and conditions shall prevail.
- WILEY expressly reserves all rights not specifically granted in the combination of (i) the license details provided by you and accepted in the course of this licensing transaction, (ii) these terms and conditions and (iii) CCC's Billing and Payment terms and conditions.
- This Agreement will be void if the Type of Use, Format, Circulation, or Requestor Type was misrepresented during the licensing process.
- This Agreement shall be governed by and construed in accordance with the laws of the State of New York, USA, without regards to such state's conflict of law rules.

Any legal action, suit or proceeding arising out of or relating to these Terms and Conditions or the breach thereof shall be instituted in a court of competent jurisdiction in New York County in the State of New York in the United States of America and each party hereby consents and submits to the personal jurisdiction of such court, waives any objection to venue in such court and consents to service of process by registered or certified mail, return receipt requested, at the last known address of such party.

## **WILEY OPEN ACCESS TERMS AND CONDITIONS**

Wiley Publishes Open Access Articles in fully Open Access Journals and in Subscription journals offering Online Open. Although most of the fully Open Access journals publish open access articles under the terms of the Creative Commons Attribution (CC BY) License only, the subscription journals and a few of the Open Access Journals offer a choice of Creative Commons Licenses:: Creative Commons Attribution (CC-BY) license [Creative Commons Attribution Non-Commercial \(CC-BY-NC\) license](#) and [Creative Commons Attribution Non-Commercial-NoDerivs \(CC-BY-NC-ND\) License](#). The license type is clearly identified on the article.

Copyright in any research article in a journal published as Open Access under a Creative Commons License is retained by the author(s). Authors grant Wiley a license to publish the article and identify itself as the original publisher. Authors also grant any third party the right to use the article freely as long as its integrity is maintained and its original authors, citation details and publisher are identified as follows: [Title of Article/Author/Journal Title and Volume/Issue. Copyright (c) [year] [copyright owner as specified in the Journal]. Links to the final article on Wiley's website are encouraged where applicable.

### **The Creative Commons Attribution License**

The [Creative Commons Attribution License \(CC-BY\)](#) allows users to copy, distribute and transmit an article, adapt the article and make commercial use of the article. The CC-BY license permits commercial and non-commercial re-use of an open access article, as long as the author is properly attributed.

The Creative Commons Attribution License does not affect the moral rights of authors, including without limitation the right not to have their work subjected to derogatory treatment. It also does not affect any other rights held by authors or third parties in the article, including without limitation the rights of privacy and publicity. Use of the article must not assert or imply, whether implicitly or explicitly, any connection with, endorsement or sponsorship of such use by the author, publisher or any other party associated with the article.



For any reuse or distribution, users must include the copyright notice and make clear to others that the article is made available under a Creative Commons Attribution license, linking to the relevant Creative Commons web page.

To the fullest extent permitted by applicable law, the article is made available as is and without representation or warranties of any kind whether express, implied, statutory or otherwise and including, without limitation, warranties of title, merchantability, fitness for a particular purpose, non-infringement, absence of defects, accuracy, or the presence or absence of errors.

### **Creative Commons Attribution Non-Commercial License**

The [Creative Commons Attribution Non-Commercial \(CC-BY-NC\) License](#) permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.(see below)

### **Creative Commons Attribution-Non-Commercial-NoDerivs License**

The [Creative Commons Attribution Non-Commercial-NoDerivs License](#) (CC-BY-NC-ND) permits use, distribution and reproduction in any medium, provided the original work is properly cited, is not used for commercial purposes and no modifications or adaptations are made. (see below)

### **Use by non-commercial users**

For non-commercial and non-promotional purposes, individual users may access, download, copy, display and redistribute to colleagues Wiley Open Access articles, as well as adapt, translate, text- and data-mine the content subject to the following conditions:

- The authors' moral rights are not compromised. These rights include the right of "paternity" (also known as "attribution" - the right for the author to be identified as such) and "integrity" (the right for the author not to have the work altered in such a way that the author's reputation or integrity may be impugned).
- Where content in the article is identified as belonging to a third party, it is the obligation of the user to ensure that any reuse complies with the copyright policies of the owner of that content.
- If article content is copied, downloaded or otherwise reused for non-commercial research and education purposes, a link to the appropriate bibliographic citation (authors, journal, article title, volume, issue, page numbers, DOI and the link to the definitive published version on **Wiley Online Library**) should be maintained. Copyright notices and disclaimers must not be deleted.

- Any translations, for which a prior translation agreement with Wiley has not been agreed, must prominently display the statement: "This is an unofficial translation of an article that appeared in a Wiley publication. The publisher has not endorsed this translation."

### **Use by commercial "for-profit" organisations**

Use of Wiley Open Access articles for commercial, promotional, or marketing purposes requires further explicit permission from Wiley and will be subject to a fee. Commercial purposes include:

- Copying or downloading of articles, or linking to such articles for further redistribution, sale or licensing;
- Copying, downloading or posting by a site or service that incorporates advertising with such content;
- The inclusion or incorporation of article content in other works or services (other than normal quotations with an appropriate citation) that is then available for sale or licensing, for a fee (for example, a compilation produced for marketing purposes, inclusion in a sales pack)
- Use of article content (other than normal quotations with appropriate citation) by for-profit organisations for promotional purposes
- Linking to article content in e-mails redistributed for promotional, marketing or educational purposes;
- Use for the purposes of monetary reward by means of sale, resale, licence, loan, transfer or other form of commercial exploitation such as marketing products
- Print reprints of Wiley Open Access articles can be purchased from:  
[corporatesales@wiley.com](mailto:corporatesales@wiley.com)

Further details can be found on Wiley Online Library  
<http://olabout.wiley.com/WileyCDA/Section/id-410895.html>

Other Terms and Conditions:

**v1.9**

Questions? [customercare@copyright.com](mailto:customercare@copyright.com) or +1-855-239-3415 (toll free in the US) or +1-978-646-2777.

**Gratis licenses (referencing \$0 in the Total field) are free. Please retain this printable license for your reference. No payment is required.**

---

---

## **APPENDIX C – Ethical Consent Forms**

### **Wilfrid Laurier University**

#### **Research Consent Form**

#### **Linking Place Identity, Environmental Change and Adaptation in the Context of Changing Water Conditions in NWT**

Dear Participant:

I would like to invite you to participate in a collaborative research study to examine changing water conditions around the Slave River Delta and Great Slave Lake and its impact on community members in Fort Resolution. The study will also examine the importance of water to community members and how relationships with water are important for the identity and well-being of community members. As some members of the community have expressed a desire for the community to be a voice for water issues, I hope to help document the values and importance of water for the community, how water is changing and what such changes mean for community members. The results of this research will benefit groups responsible for developing water management strategies to address water change by identifying community concerns regarding industrial development, climate change/variability, and the impacts of these on water resources.

This research project is being undertaken by graduate student Jennifer Fresque from the Department of Geography and Environmental Studies at Wilfrid Laurier University, and under the supervision of Prof. Derek Armitage, and with assistance from community researcher(s)

---

During the course of this study, approximately 75 community members, land users and Elders will be asked to participate in interviews, focus groups and/or field excursions. The purpose of these activities is to generate information about the types of changes that have been occurring in water in the region, the importance of such changes for the community and how people are addressing them, and how relationships with water are important for the identity and well-being of community members. Interviews and focus groups are expected to last roughly one hour. You may choose to end the interview/participation in the focus group at any point. Honoraria will be provided for these activities at a rate of \$75.00 per interview.

Your responses will be written down and, if you approve, may be documented either by audio or video recorder. Please note that your participation is completely voluntary, that you may refuse to answer any question, and that you are free to end any research related activity at any time without penalty. If you decide to participate, you may withdraw from the study at any time without penalty and without loss of benefits to which you are otherwise entitled. If you withdraw from the study, every attempt will be made to remove your data from the study, and have it destroyed. You have the right to omit any question(s) you choose. All participant comments will be regarded as completely confidential unless individual permission is given to use personal names and identifiers. Research notes will be accessible only to the two

researchers involved and to community research assistants or interpreters who agree to maintain confidentiality. The confidentiality of other focus group participants cannot, however, be guaranteed. Records of all research notes will be maintained in a locked cabinet when not in use. Copies of research data will be archived with Deninu Kue First Nation and/or Fort Resolution Métis Council. Any participant statements will not be used without permission.

Results from this study will be shared at community meetings, conferences, and through a PhD thesis, journal articles and book chapters. A full summary report of the results will also be prepared and made available to any interested participant. This report will be prepared toward the end of this particular research project (likely in 2011). The results of this study should be of particular interest to community members in Fort Resolution, to those with concerns over water resource change in the region, and to those participating in water management activities at the local or regional scale.

If you have questions at any time about this study or the procedures, you may contact either researcher at the Department of Geography and Environmental Studies, Wilfrid Laurier University (519-884-0710, ext. 3872 or 2653, [fres3130@mylaurier.ca](mailto:fres3130@mylaurier.ca) or [darmitag@wlu.ca](mailto:darmitag@wlu.ca)). This project has been reviewed and approved by the University Research Ethics Board [REB #2461]. If you feel you have not been treated according to descriptions in this form, or that your rights as a participant in research have been violated during the course of this project, you may contact Dr. Robert Basso, Chair, University Research Ethics Board, Wilfrid Laurier University, (519) 884-1970, extension 5225 or [rbasso@wlu.ca](mailto:rbasso@wlu.ca).

I would like to invite you to participate in an interview/focus group, as your insight and experiences would be valuable in understanding how water is changing in Great Slave Lake and the Slave River Delta, and what these changes mean for the community. Would you like to participate?

►By signing below I CONSENT to the following (check appropriate boxes):

➤ Identification in publications, presentations or reports related to this project:

Yes  No

➤ Use of verbatim quotes in publications, presentations or reports related to this project:

Yes  No

➤ Being:

-audio taped  Yes  No

-video taped  Yes  No

-photographed  Yes  No

➤ Allowing the use of the following in publications, presentations or reports related to this project:

-audio/video tapes  Yes  No

-photographs  Yes  No

Print name: \_\_\_\_\_ Sign name: \_\_\_\_\_

Date: \_\_\_\_\_

**Wilfrid Laurier University**  
Informed Consent Statement - Youth Photovoice Project

**Linking Place Identity, Environmental Change and Adaptation in the Context of Changing Water Conditions in NWT**

Dear Participant,

You are invited to participate in part of a research study to examine changing water conditions around the Slave River Delta and Great Slave Lake and its impact on community members in Fort Resolution. The study will also examine the importance of water to community members and how relationships with water are important for the identity and well-being of community members. This portion of the research project is specifically youth-focused, and will involve youth taking photos of their experiences of water change and what water means to them in their everyday lives. The results of this research will provide an understanding of water change from the perspective of youth in the community, and will benefit groups responsible for developing water management strategies by identifying youth concerns.

This research project is being undertaken by graduate student Jennifer Fresque from the Department of Geography and Environmental Studies at Wilfrid Laurier University, under the supervision of Prof. Derek Armitage. During the course of this portion of the project youth will be asked to participate in a photography project. This will involve taking photos based on themes provided to youth from the researchers, as well group discussion sessions. This project is being run in classes at Deninu School, and will contribute to classroom projects and curriculum. The project is expected to run for approximately four weeks, and youth will be asked to meet with the researcher and the whole group once per week. The purpose of these activities is to explore the youth perspective about the types of changes that have been occurring in water resources in the region, the importance of such changes for the community and how people are addressing them, and how relationships with water are important for the identity and well-being of community members. Digital cameras will be provided to youth who are participating. At the end of the project, an exhibit of all participant photos may be held in the community to showcase the work of community youth. Cameras will be donated to the school once the project is completed.

Your statements during the individual and group sessions will be written down and, if you approve, may be either audio or video recorded. In addition, photos and their descriptions provided by participants will be used in the larger research study, with permission from you and your parents or guardians. All photos used will be credited to the photographers if permission to identify participants is given. In addition, permission will be obtained from anyone who may appear in participants photos prior to use (i.e., if you take a picture of a family member, they will have to consent to having that photo used as part of the project).

Please note that your participation is completely voluntary, that you may refuse to answer any question, and that you are free to end any research related activity at any time without penalty. If you decide to participate, you may leave the study at any time without penalty and without loss of benefits to which you are otherwise entitled. If you leave the study, every attempt will be made to remove your data from the study, and have it destroyed. All participant comments will be regarded as completely confidential in the research thesis and related reports unless individual and parental permission is given to use personal names and identifiers. Research notes related to the thesis will be accessible to two researchers involved and to community research assistants or interpreters who agree to maintain confidentiality. In addition, as this project is being implemented as part of the curriculum at Deninu

School, participant comments, photos and work related to this project may be used as part of classroom projects by students and teachers at Deninu School. The confidentiality of other group participants during group sessions cannot, however, be guaranteed. Records of all research notes related to the thesis project will be maintained in a locked cabinet when not in use. Copies of research data will be archived with Deninu Kue First Nation. Any participant comments and photos will not be used without permission.

Results from this study will be shared at community meetings, conferences, and through a PhD thesis, journal articles and book chapters. A full summary report of the results will also be prepared and made available to any interested participant. This report will be prepared toward the end of this particular research project (likely in 2011). The results of this portion of the study will highlight youth experience of water change, and should be of particular interest to community members in Fort Resolution, to those with interest in water resource change in the region, and to those participating in collaborative management activities at the local or regional scale.

If you have questions at any time about this study or the procedures, you may contact either researcher at the Department of Geography and Environmental Studies, Wilfrid Laurier University (519-884-0710, ext. 3872 or 2653, [fres3130@wlu.ca](mailto:fres3130@wlu.ca) or [darmitag@wlu.ca](mailto:darmitag@wlu.ca)). This project has been reviewed and approved by the University Research Ethics Board [REB. #2461]. If you feel you have not been treated according to descriptions in this form, or that your rights as a participant in research have been violated during the course of this project, you may contact Dr. Robert Basso, Chair, University Research Ethics Board, Wilfrid Laurier University, (519) 884-1970, extension 5225 or [rbasso@wlu.ca](mailto:rbasso@wlu.ca)

**Youth Consent:**

►By signing below I CONSENT to the following (check appropriate boxes):

➤Being identified in publications, presentations or reports related to this project:

Yes  No

➤Use of my photographs in publications, presentations or reports related to this project:

Yes  No

➤Use of verbatim quotes in publications, presentations or reports related to this project:

Yes  No

➤Being:

-audio taped  Yes  No                      -video taped  Yes  No

-photographed  Yes  No

➤Allowing the use of the following in publications, presentations or reports related to this project:

-audio/video tapes  Yes  No                      -photographs  Yes  No

Print name: \_\_\_\_\_ Sign name: \_\_\_\_\_

Date: \_\_\_\_\_

**Wilfrid Laurier University**

Informed Consent Statement - Youth Photovoice Project Parental Consent

**Linking Place Identity, Environmental Change and Adaptation in the Context of Changing Water Conditions in NWT**

Dear Parent/Guardian,

Your child has been invited to participate in part of a research study to examine changing water conditions around the Slave River Delta and Great Slave Lake and its impact on community members in Fort Resolution. The study will also examine the importance of water to community members and how relationships with water are important for the identity and well-being of community members. This portion of the research project is specifically youth-focused, and will involve youth taking photos of their experiences of water change and what water means to them in their everyday lives. The results of this research will provide an understanding of water change from the perspective of youth in the community, and will benefit groups responsible for developing water management strategies by addressing youth concerns.

This research project is being undertaken by graduate student Jennifer Fresque from the Department of Geography and Environmental Studies, Wilfrid Laurier University, under the supervision of Prof. Derek Armitage. During the course of this portion of the project youth will be asked to participate in a photography project. This will involve taking photos based on themes provided to youth from the researchers, as well as group discussion sessions. This project is being run in classes at Deninu School, and will contribute to classroom projects and curriculum. The project is expected to run for approximately four weeks, and participants will be asked to meet with the researcher and the whole group once per week. The purpose of these activities is to generate information from a youth perspective about the types of changes that have been occurring in water resources in the region, the importance of such changes for the community, and how relationships with water are important for the identity and well-being of community members. Digital cameras will be provided to youth who are participating. Following completion, an exhibit of all participant photos may be held in the community to showcase the work of community youth. Cameras will be donated to the school following completion of the project.

Your child's statements during the individual and group sessions will be written down and, if you approve, may be either audio or video recorded. In addition, photos and their descriptions provided by participants will be incorporated into the larger research study, with permission from participants and their parents or guardians. All photos used will be credited to the photographers if permission to identify participants is given. In addition, permission will be obtained from anyone who may appear in participants photos prior to use (i.e., if a picture is taken of a family member, they will have to consent to having that photo used as part of the project).

Please note that your child's participation is completely voluntary, that they may refuse to answer any question, and that they are free to end any research related activity at any time. You are also free to refuse or end their participation in the project at any time. If your child decides to participate, he/she may leave the study at any time without penalty and without loss of benefits to which they are otherwise entitled. If they leave the study, every attempt will be made to remove their data from the study, and have it destroyed. All participant comments will be regarded as completely confidential in the research thesis and related reports unless individual and parental permission is given to use



personal names and identifiers. Research notes related to the thesis will be accessible to two researchers involved and to community research assistants or interpreters who agree to maintain confidentiality. In addition, as this project is being implemented as part of the curriculum at Deninu School, participant comments, photos and work related to this project may be used as part of classroom projects by students and teachers at Deninu School. The confidentiality of other group participants during group sessions cannot, however, be guaranteed. Records of all research notes related to the thesis project will be maintained in a locked cabinet when not in use. Copies of research data will be archived with Deninu Kue First Nation. Any participant comments and photos not be used without permission.

Results from this study will be shared at community meetings, conferences, and through a PhD thesis, journal articles and book chapters. A full summary report of the results will also be prepared and made available to any interested participant. This report will be prepared toward the end of this particular research project (likely in 2011). The results of this portion of the study will highlight youth experience of water change, and should be of particular interest to community members in Fort Resolution, to those interested in water resource change in the area, and to those participating in collaborative management activities at the local or regional scale.

If you have questions at any time about this study or the procedures, you may contact either researcher at the Department of Geography and Environmental Studies, Wilfrid Laurier University (519-884-0710, ext. 3872 or 2653, [fres3130@wlu.ca](mailto:fres3130@wlu.ca) or [darmitag@wlu.ca](mailto:darmitag@wlu.ca)). This project has been reviewed and approved by the University Research Ethics Board REB #2461]. If you feel you or your child have not been treated according to descriptions in this form, or that you or your child's rights as a participant in research have been violated during the course of this project, you may contact Dr. Robert Basso, Chair, University Research Ethics Board, Wilfrid Laurier University, (519) 884-1970, extension 5225 or [rbasso@wlu.ca](mailto:rbasso@wlu.ca)

➤ I give permission for \_\_\_\_\_ to participate in the photography portion of this study:

Yes  No

➤ My child being identified in publications, presentations or reports related to this project:

Yes  No

➤ Use of my child's photographs in publications, presentations or reports related to this project:

Yes  No

➤ Use of my child's verbatim quotes in publications, presentations or reports related to this project:

Yes  No

➤ My child being:

-audio taped  Yes  No -video taped  Yes  No -photographed  Yes  No

➤ Allowing the use of the following in publications, presentations or reports related to this project:

-audio/video tapes  Yes  No -photographs  Yes  No

Print name: \_\_\_\_\_ Sign name: \_\_\_\_\_

Date: \_\_\_\_\_

## APPENDIX D – Section of Research Pamphlet

### Background

Water is important to community members, and changes to both quantity and quality of water in the Slave River Delta and Great Slave Lake are being observed.

Water is an important part of identity for members of the community and people have important relationships with water in the region.

Highlighting the relationship between identity, water, environmental change and adaptation can contribute to building a voice for water issues and identifying key community concerns and priorities for the protection and use of water.



### Marsi Cho!

Thank you for hosting me in your community in 2008 and 2009, and now in 2010.

I will be in Fort Resolution during the fall of 2010 and will return in the winter to continue the project. Please contact me if you have any questions, comments or would like to participate.



#### **Contact Info:**

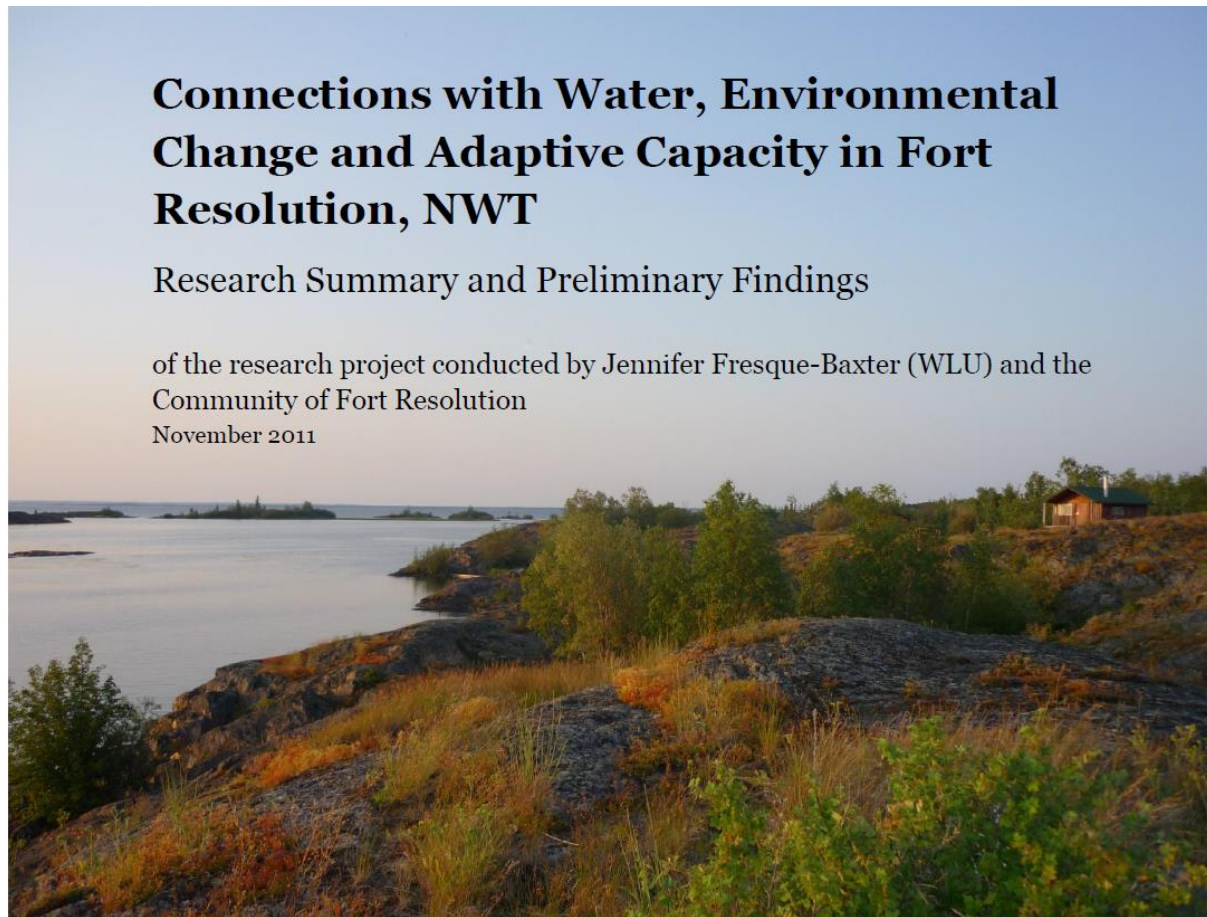
Jennifer Fresque:  
Department of Geography & ES  
Wilfrid Laurier University, Waterloo  
Email: [fres3130@mylaurier.ca](mailto:fres3130@mylaurier.ca)  
Tel.: 1-519-884-1970, x3872

### Linking Place Identity, Adaptation and Changing Water Conditions in Fort Resolution, NT



*Photo: B. Benkert*

A summary of proposed research to be conducted by Jennifer Fresque (Wilfrid Laurier) and the Community of Fort Resolution



# Connections with Water, Environmental Change and Adaptive Capacity in Fort Resolution, NWT

## Research Summary and Preliminary Findings

of the research project conducted by Jennifer Fresque-Baxter (WLU) and the Community of Fort Resolution  
November 2011

### Summary of Main Findings to Date:

1. Changing water conditions in the South Slave Region have been observed by Fort Resolution community members, including impacts to water quality and quantity.
2. Community members identified several key causes of changing water conditions, including dams, oil sands development and mining activity.
3. Water is very important to community members for identity and wellbeing. People are very connected to places in and around Fort Resolution, including the Slave River Delta and Taltson.
4. Changing water conditions are impacting the connections community members have with water and place. Many individuals described feelings of loss associated with the impacts from changing water conditions.
5. The majority of impacts are seen as occurring outside the community and region, which has resulted in frustration for many community members.
6. Several key actions for protecting water, and the places people are connected to, were identified by community members, including increased water monitoring and development of partnerships.

## Connections with Water: Project Overview

This booklet provides a summary of the research project ***Connections with Water, Environmental Change and Adaptive Capacity in Fort Resolution, NWT***, conducted by Jennifer Fresque-Baxter (Wilfrid Laurier University) and the community of Fort Resolution in 2010 and 2011. This research project is part of my university thesis. This booklet highlights key preliminary research findings. A full report on all research findings and the complete university thesis are anticipated to be completed by summer 2012.

**Water is important to Fort Resolution community members**, and changes to both quantity and quality of water in the South Slave region are being observed. Water is an important part of identity for members of the community, and people have important connections with water in the region.

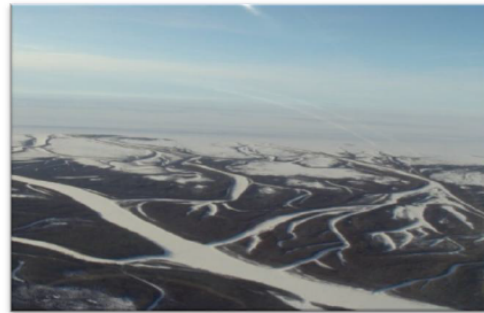


Photo: B. Benkert

Working with community members, I explored how and why water is important, how connections with water are impacted by environmental change (such as climate change and southern industrial development), and opportunities for identifying key community concerns and priorities regarding the protection and use of water.

I want to thank **Deninu Kue First Nation, Fort Resolution Métis Council, Hamlet of Fort Resolution and Deninu School** for working with me on this project and for all of the support provided. I also want to thank everyone in Fort Resolution for having me in your community for the last two years. *Marsi cho!*

### Summary of Project Activities

**Interviews** (a total of 50 interviews were conducted)

- Interviews about changing water conditions with Elders, water resource managers, and government personnel
- Interviews about sense of place, connections to the land and impacts of water change with a broad spectrum of community members



**Focus Group** (with 11 participants)

- 1 focus group was held to discuss relationships with water and the land, impacts from change, and community concerns and priorities for the protection and use of water

**Youth Photography Project** (with Grades 7/8 and 11/12 at Deninu School)

- We used photography to explore the relationship that community youth have to water and place; this was integrated into classroom curriculum objectives
- Youth were provided with cameras to take pictures

## Summary of Preliminary Findings: Changing Water Conditions

### Water in the South Slave Region is Changing

Drawing on traditional and local knowledge, the following changes in water conditions have been observed by community members:

#### **Water Quantity and Flow:**

- Water levels on Great Slave Lake, Slave River, the Delta, Taltson River and others, have dropped significantly in the last few years, with severe decrease observed in the last two years. Overall decline in water levels has been occurring for several decades.
- Average flows have on the Slave River decreased by 20% in the May to October periods (Source: *Mackenzie River Basin Board, 2003*). Community residents noted that the Slave River current has declined substantially.
- Many areas in the Slave River Delta have been observed to be drying out. In addition, community members noted that many channels that were previously used for travel in the Delta are no longer accessible due to declining water levels.



#### **Water Quality**

- Many community members expressed concerns about the safety of drinking water from Great Slave Lake and the Slave River Delta, due to increased threat of contamination. Many people take extra precautions regarding drinking water when on the land, including boiling and/or brining bottled water.
- Residents also noted that in many places, water has changed colour, and no longer tastes the same. People have also noticed brown foam and scum floating on the surface of water in many places in the Delta.
- Concerns about declining the impacts of water quality on animals and plants in the region were also noted. These included increased observation of abnormal fish, and a decline in key species such as moose, beavers and muskrats.

### What's Causing Changes? 3 Key Community Concerns

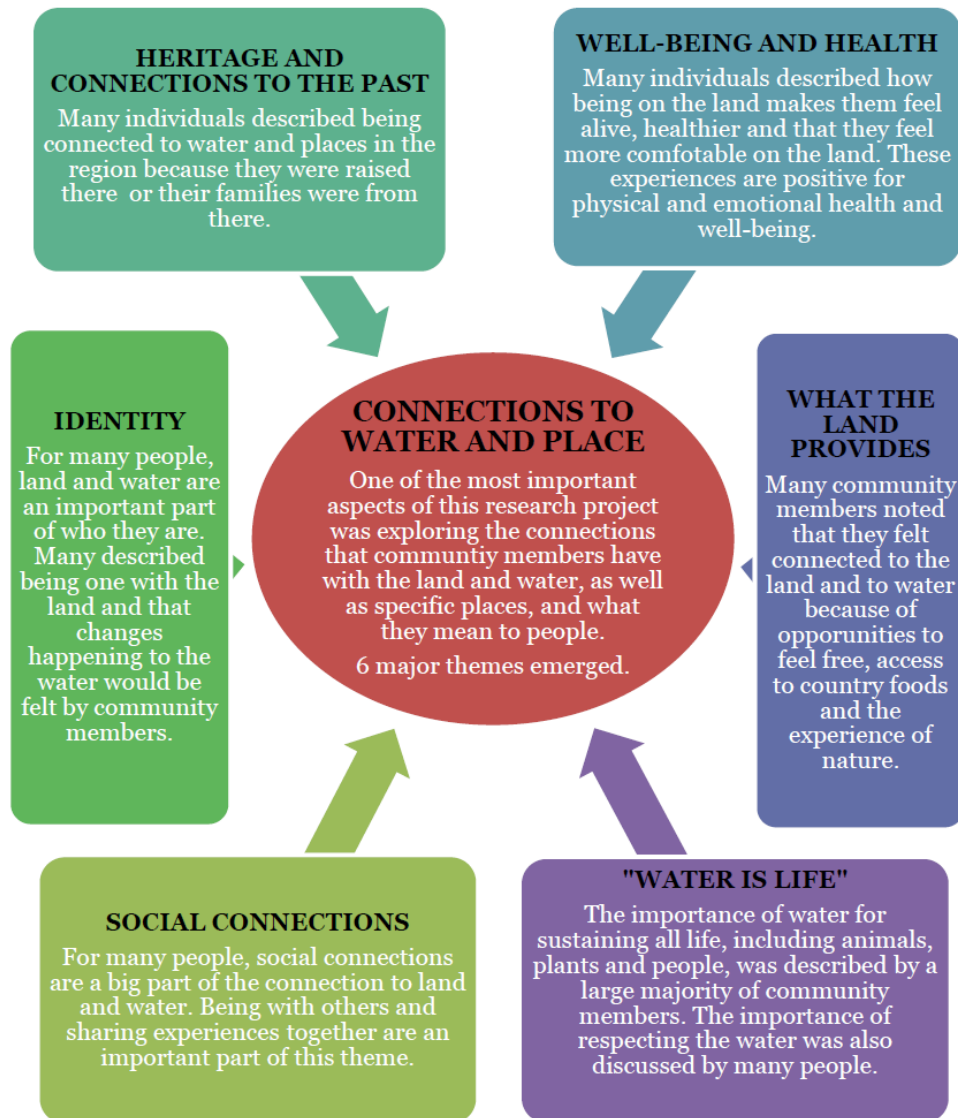
**Dams:** Taltson and Bennett Dams were identified by residents as one of the key factors impacting water levels and water flow in the region, through diversions for hydroelectricity. Many residents noted that at peak operating times, release of flow from the dams has impacted key harvest species (beavers and muskrats) and decreased safety of ice-based travel.

**Oil Sands Development:** Oil sands development in Alberta is one of the most prevalent concerns in the community. Many residents feel that the oil sands are having impacts on water quantity, due to withdrawals from the Athabasca River for operations. Concerns about impacts to water quality through contamination associated with tailings ponds were also raised.

**Mining and Other Industrial Activities:** Many people noted concerns about the effects of mining operations (past and present) and pulp and paper mills on water quality, both in the NWT and outside of the territory in BC, Saskatchewan and Alberta.

Additional community concerns will be included in the full report.

**Summary of Preliminary Findings: Connections to Water and Place**



## Summary of Preliminary Findings: Impacts of Change

### Loss of Places and Impacts to Lifestyle

- Many places that people used to use or travel to are now inaccessible due to declining water levels. In addition, declining water levels are making it harder for trappers and harvesters to engage in traditional subsistence activities.
- Many residents described feelings of loss because places important to them are changing. There is sadness and frustration that people can no longer use the land and water in the same way as before.
- Observations of abnormal and diseased fish have increased. Many residents have caught fish that have pus, sores and cysts, as well as internal damage. It is felt that these fish are not safe for consumption.

### Concerns about Drinking Water and Health Impacts

- There is an increasing mistrust of the safety of water for consumption, both in the community and out on the land, particularly on the Slave River.
- The impact of declining water quality is a pressing concern for community members. Increased incidences of cancer and other sickness have been noted, and are seen as linked to contamination from industrial development.
- Many community members noted that in some places, water has changed colour, taste and smell, and many will no longer drink the water from the Slave River.

***One of the key findings of this research is that it is imperative that steps are taken to ensure community concerns about water are heard and addressed appropriately at multiple levels. Many community members expressed frustration with the fact that many of the impacts on water in the region are coming from outside the community, and in some cases beyond territorial borders.***



### Strategies for Action

Many community members identified potential strategies for the use and protection of water resources in the region. These strategies can help protect places of personal, ecological and cultural importance. Understanding why water and certain places are important to community members and how people are connected to these places is a key first step. These strategies include: increased water monitoring; development of partnerships and collaboration in the community and with other communities, government and industry; building a voice to convey concerns to a broader audience, including government and industry; and creating opportunities to connect youth to the land and teach traditional values.

## Connections with Water: Benefits and Next Steps

### Benefits of this Research to Fort Resolution

- Compilation of information about water quality and quantity conditions in the SRD and GSL
- Identification and highlighting of key values, concerns and priorities related to water
  - Can contribute to the community's voice around water issues, identified as an important strategy for action by many community members
  - Compilation of information, including the importance of connections to land and water and the impacts of changing water conditions, which may benefit groups (at multiple levels) responsible for developing water management strategies
    - Such information may help such groups identify and respond to community concerns regarding impacts to water from industrial development and climate change
  - Engagement of youth in a community-based project about their land and waters
  - Tangible products (e.g. photo compilations and reports) that will remain in the community



### Next Steps

- I will be in Fort Resolution November/December 2011 to review findings with the community and people interviewed as part of the project to ensure that information to be included in final report is appropriate and accurate.
- Following this trip, I will prepare the final community reports with all findings as well as the final university thesis (by summer 2012). The final reports and thesis will include sections on the importance of connections to place in planning for the use and protection of water (adaptive capacity), and recommendations for action and research.
  - All reports, the thesis and any related materials (e.g. journal articles, book chapters, etc.) will be forwarded to the community and any interested community members.
  - All research data (interview tapes, transcripts, etc.) will be archived with community organizations so that data remains in the community.

### Feedback

*I welcome and encourage feedback from all community members on the preliminary findings of the study to date.* If you have any comments or questions, you can contact me in Fort Resolution between November 18<sup>th</sup> and December 18<sup>th</sup>, or at:

Jennifer Fresque-Baxter  
Department of Geography & Environmental Studies,  
Wilfrid Laurier University, Waterloo, N2L 3C5  
Email: [fres3130@mylaurier.ca](mailto:fres3130@mylaurier.ca)  
Tel.: 1-519-884-0710, x4481



Photo: H. Beaulieu



## **Research Activities Report September – December 2010**

By Jennifer Fresque, Graduate Student, Wilfrid Laurier University  
Project: **Linking Place Identity, Environmental Change  
and Adaptation in the Context of Changing Water  
Conditions on Fort Resolution, NT**

Firstly, I would like to thank Deninu Kue First Nation, Fort Resolution Métis Council, Deninu Community Council/Hamlet of Fort Resolution and Deninu School for ongoing support and assistance with this project. Your support has been instrumental in helping me begin this project and complete my research activities during my stay here from September to December. I look forward to returning in the new year and continuing work on this project. Water is very important to members of this community, and I hope this project will continue to build and when completed will contribute to the community.

This document outlines my activities for my field work visit from September-December 2010. This report will also outline my proposed activities for the new year. If you have any questions or comments, do not hesitate to contact me at fres3130@mylaurier.ca or 519-998-8861.

### **Summary of Project Activities (Sept.-Dec.)**

#### ***September***

- Return to the community
- Meeting with staff at DKFN, FRMC, DCC and Deninu School
- Presentation to Chief & Council, Environment and Conservation Committee and Elder Senate
  - Ideas from this meeting were incorporated into the project, many suggestions were provided by those present at this meeting
- Meetings with FRMC, DCC, AAROM and Deninu School for further suggestions and feedback on project. These were also incorporated.
- Signed research agreement with DKFN
- Application for research licence from Aurora Research Institute (ARI)
- Presentation to students at Deninu School

#### ***October***

- Guided trip on Slave River Delta with Lawrence Fabien
- Ongoing meetings with staff at community organizations
  - Determination of rate of honoraria

- Discussion of who to interview in the community
- Development of curriculum based photo project to be conducted in the schools
  - Originally the photo project was to be completed with 10 youth volunteers. After discussion with the teachers, it was determined it would be more beneficial to students and the school to conduct the project in the classroom and to meet curriculum objectives. This way all students were able to participate, but only those who signed consent forms will have information included in the research project.

### ***November-December***

- Receipt of ARI research license
- Hiring of two community researchers: Catherine Boucher and Velma Delorme
  - Signed research agreement with each researcher
  - Determined work schedule and rate of pay
- Set up of honoraria payment process at DKFN and FRMC
  - Interviewees to be paid by each office, following which WLU will be invoiced
- List of names of Elders and environmental staff provided by DKFN and FRMC

### Specific Research Activities During this Time:

1. 16 interviews completed about how water is changing in the Slave River Delta and other areas in the region
  - 10 Elders
    - 5 Dene Elders
    - 5 Métis Elders
  - 6 Environment staff
  - Most Interviews were approximately an hour in length
  - Names of those interviewed have been submitted to the office which made the recommendation
    - Honoraria payments are in the final stages of being fully processed
    - Invoices have been forwarded to WLU to pay community researchers

*Preliminary results indicate serious concerns with lowering water levels and contamination from development both within and outside of the traditional territory, and impacts to hunting/trapping and traditional food consumption. Further preliminary results will be available upon my return in January, once I have had the opportunity to review the interview transcripts and my notes.*

2. Completion of one round of the photo project with the Grade 7/8 Class at Deninu School (Mr. McTurk's class)
  - 2 field trips undertaken to take photos
    - 1 with majority of high school
    - 1 with just Gr. 7/8
  - Students in grade 7/8 chose their favourite photos and wrote a story to accompany the photo from the perspective of someone or something that has been affected by water change or climate change. The final products are excellent and highlight the experiences community youth have had with environmental change in the region. This project also meets literacy objectives determined by the teacher.
    - Lesson teaching by researcher to accompany development of project
    - Wrap-up presentation for high school students
    - Wrap-up presentation and certificates of participation given to students in Gr. 7/8
  - Cameras have been left at the school for use during my time home
- **A renewal for ARI license will be submitted in December. All community organizations who received an original copy of the license will be forwarded the new application and asked to approve the renewal by ARI**
3. Other activities during my time in the community
 

During my time in Fort Resolution, I also had the opportunity to engage in and/or volunteer at a number of community events. There were extremely enjoyable and allowed me to contribute back to the community while I was here, including:

  - participation in Traditional Challenge and Culture Days activities
  - supervising at the Much Music Dance
  - assistance with Halloween activities for DCC Recreation, including costume judging, haunted house and family activities
  - assistance with Family Fun Night during NAAW
  - participation in Terry Fox Run at School

### Proposed Activities for 2011-2012

#### ***January-April***

- Return to community in late January
- Hiring of community researchers (may have additional funds for at least one additional person if there is interest)
- Completion of roughly 40 interviews about place-identity (relationships people in community have to land and water, and the delta)

- At least 2 focus groups about place-identity, environmental change and opportunities for action around water issues are proposed to be held
- On-going work with Deninu School in high school classes (planning for this is currently underway)
- Final wrap-up presentation for Chief & Council, Environment and Conservation Committee and Elder Senate
- Wrap up meetings/presentations with other community organizations

***Spring/Summer 2011***

- Transcription of focus groups and interviews, data analysis
- Preparation of thesis
- Preparation of reports, briefs & research summaries

***Fall/Winter 2011***

- Return trip to Fort Resolution to verify results, interpretation of findings and review thesis with community partners (Amendment of thesis as necessary)
- Presentation of findings to Chief & Council, FRMC, DCC and Deninu School
- Community open house to present findings
- Reports, briefs & research summaries related to the project will be made available to community organizations and interested members of the community

***Spring/Summer 2012***

- Completion and submission of thesis to Wilfrid Laurier University. A final copy will be made available to DKFN, FRMC, DCC & Deninu School.
- Preparation of journal articles, etc. These will be reviewed with the community partners prior to submission

**Thank you again for your support. It has been a privilege to spend time in your community. I will see you in January! Marsi Cho!**

## APPENDIX G – Timeline of Field Work Trips and Activities

Date	Duration	Key Activities
November 2008	5 days	Scoping trip to Fort Resolution: <ul style="list-style-type: none"> <li>• Met with Deninu Kue Chief and Council to introduce the project and solicit feedback for shaping the research to be community relevant</li> <li>• Presentation to Chief and Council, Elders and other community members</li> <li>• Met with Fort Resolution Métis Council</li> <li>• Met with staff at local school</li> <li>• Presented on climate change impacts to high school classes</li> </ul>
March 2009	Ongoing	Began document review of available scientific literature, grey literature, existing theses on water resource change, adaptive capacity and traditional knowledge in Fort Resolution, and publically available community documents <ul style="list-style-type: none"> <li>• This provided context for designing the research and interview questions</li> </ul>
July 2009	3 weeks	Scoping trip #2 to Fort Resolution <ul style="list-style-type: none"> <li>• Met with DKFN, FRMC to review potential research design and solicit feedback</li> <li>• Met with various community members to discuss water to help frame research questions</li> <li>• Finalized research topic and approach to research</li> <li>• Participated in a trip to the Slave River Delta to experience the landscape first hand</li> <li>• Participated in community events</li> <li>• Took part in a family fishing trip</li> </ul>
September 2010- December 2010	3 months	Began data collection for research project: <ul style="list-style-type: none"> <li>• Secured research license from Aurora Research Institute</li> <li>• Presented research approach, framework and methods to DKFN Chief and Council, Elder Senate and Environment Committee</li> <li>• Prepared and distributed a brochure on the research purpose, and activities</li> <li>• Took a trip on Slave River Delta to examine changes from previous year</li> <li>• Participated with an Elder in tour of the lake in and around the community and monitored water levels at a nearby river</li> </ul>

Date	Duration	Key Activities
		<ul style="list-style-type: none"> <li>• Presented preliminary findings, summary of research activities and next steps to DKFN Chief and Council and FRMC staff</li> <li>• Took part in community activities, both as participant and as volunteer, including a drum dance, traditional challenge, Halloween contest, and supervised 2 youth dances</li> <li>• Applied for research license for 2011 field season</li> </ul>
January 2011- April 2011	2.5 months	<p>Undertook second portion of data collection:</p> <ul style="list-style-type: none"> <li>• Secured research license for 2011</li> <li>• Updated chief and council and FRMC staff on project activities for the second trip</li> <li>• Undertook 34 interviews on place identity, impacts of change and adaptation</li> <li>• Held one focus group on importance of water and impacts of change</li> <li>• Undertook one round of the participatory photography project with the Grade 11-12 students at Deninu School as part of their social studies unit</li> <li>• Was asked by AAROM staff to attend a workshop on environmental monitoring and education in Yellowknife</li> <li>• Took part in a Communities and Adaptation workshop in Yellowknife</li> <li>• Was asked by DKFN to accompany Elders and staff as a resource person to a workshop on community-based monitoring hosted by Government of the Northwest Territories in Fort Smith</li> <li>• Presented preliminary findings, summary of research activities and next steps to DKFN Chief and Council and FRMC staff</li> </ul>
November 2011 – December 2011	1 month	<ul style="list-style-type: none"> <li>• Was invited by DKFN staff to assist Elders as a support person in a research meeting held by a researcher from University of Winnipeg</li> <li>• Assisted and took part in a 2 day workshop on traditional knowledge of change in the Slave River watershed hosted by Government of the Northwest Territories</li> <li>• Distributed a brochure of research findings to community members, staff and offices</li> <li>• Met with some of the participants to review their interviews/contributions and determine appropriateness for inclusion and satisfactory analysis of participant information</li> </ul>
December 2013	3 days	<ul style="list-style-type: none"> <li>• Met with some of the participants to review their interviews/contributions and determine appropriateness for inclusion and satisfactory analysis of participant information</li> </ul>

Date	Duration	Key Activities
September 2014	1 week	<ul style="list-style-type: none"><li>• Met with some of the participants to review their interviews/contributions and determine appropriateness for inclusion and satisfactory analysis of participant information</li></ul>

## APPENDIX H – Interview Protocol

### Interview Script for Water Resource Change

**Intro script:** My name is Jennifer Fresque, and I am a graduate student at Wilfrid Laurier University. As part of my thesis research, I am working with the community of Fort Resolution to document and understand how water may be changing in the Slave River Delta and Great Slave Lake, and what these changes mean for the community. Today I will be asking you questions about water quality and quantity in Great Slave Lake and the Slave River Delta, and how this has changed over time. I am also interested in what you think the biggest impacts on the waters in region have been, and might be in the future.

[\*note: main questions to be asked are numbered. Potential probing questions, designed to elicit more information, are listed with each question and are in italics.]

#### Context Questions

1. [agency personnel] Can you tell me a little about yourself, and what you do here at [insert agency]?
  - a. *How has [insert agency] been involved in planning for the GSL and SRD?*
  - b. *What are [insert agency]'s main concerns and/or priorities for the SRD and GSL?*
2. [elders] How long have you lived in Fort Resolution?
  - a. *Do you/have you spent time on the SRD?*
  - b. *What does the SRD mean to you?*

#### Historical Conditions on the SRD and GSL

3. What were the SRD and GSL like in the past?
  - a. *Were water levels different?*
  - b. *What was water quality like in the past?*

#### Current Conditions and Impacts

4. What are the current conditions for water quantity and quality in GSL and SRD?
  - a. *What are the SRD and GSL like now?*
    - i. *What are the water levels like?*
    - ii. *Do you think the water is clean, safe to drink?*
  - b. *How has this changed from the historical conditions?*
    - i. *What do you think have caused these changes?*
5. What have been the biggest impacts on the waters in GSL and SRD?
6. What have these impacts meant for people who use the SRD and GSL?
  - a. *How have people dealt with these changes?*
  - b. *What is being done to address these changes?*
    - i. *What current plans are in place for water resources?*
  - c. *How has [insert agency] been involved in addressing impacts to water quality and quantity? [if agency personnel]*



- d. *In addition to [insert agency], who do you think should be involved in addressing such impacts?*

**Future Conditions and Future Threats**

7. How do you think water quantity and quality in the SRD and GSL will change in the future [or overall conditions]?
  - a. *In 10 years?*
  - b. *In 20 years?*
8. What do you think are the biggest threats facing water quality and quantity in the region?
  - a. *What do you think these changes will mean for the people of Fort Resolution and other communities/individuals who rely on the GSL and SRD?*
    - i. *How do you think people will cope with these changes?*
9. What do you think should be done in terms of planning and management to protect the waters in the region?
  - a. *[if agency personnel] In what ways will [insert agency] be involved in planning for the future of the SRD and GSL?*

## Interview Script 2 - Place Identity

**Intro Script:** My name is Jennifer Fresque, and I am a graduate student at Wilfrid Laurier University. As part of my thesis research, I am working with the community of Fort Resolution to document and understand how water may be changing in the Slave River Delta and Great Slave Lake, and what these changes mean for the community. I am also examining the importance of water to community members and how relationships with water are important for the identity and well-being of community members. Today I will be asking you questions about your relationship with the SRD or GSL (or places in this region), what these places mean to you and why they are important. I will also be asking you about any changes to the waters you have noticed, what these changes mean for you and what you think should be done to address them. [\*note: questions are meant to be broad (water relationships generally speaking), regional (SRD or GSL as a whole) and specific (specific place of use in SRD or on GSL); questions can be posed generally relating to whole SRD or narrowed down to a specific place as identified by participants depending on which approach works best]

[\*note: main questions to be asked are numbered, probing or follow up questions which may be necessary to elicit further information are also included, and are lettered and in italics]

### **Context and Usage**

1. Can you tell me a little about yourself?
2. How long have you lived in Fort Resolution?
3. Do you spend time on SRD and GSL?
  - a. *If yes, how often?*
  - b. *How do you use this place?*
  - c. *What do you do there?*
  - d. *Can you tell me about the SRD?*

### **Place Identity and Values**

4. What is your connection to or with water [generally]?
  - a. *In what ways is water important to you?*
  - b. *To your community?*
5. What does the SRD or GSL mean to you?
  - a. *What is most important to you about the delta? What do you value most?*
  - b. *Would you say the SRD is an important part of who you are? In what ways?*
6. Can you tell me about your favourite place or a place you use/visit often in the SRD or on GSL? It can be any place that is important to you.
  - c. *What is most important to you about this place?*
  - d. *How does being in this place make you feel?*
  - e. *When you are away from this place how do you feel?*
  - f. *What does your relationship with this place mean for you?*
  - g. *How do you see yourself in relation to this place?*
  - h. *How do you feel when you are out on [insert place]?*
7. How would you feel if this place changed?

8. Where do you feel most comfortable? Most safe and secure?
  - i. Where do you feel your best? Happiest?*
9. What do you like about living here?
  - j. Would you want to live anywhere else?*
  - k. Do you think other places could offer you the same experience as [insert place]?*

### **Environmental Change and Impacts to identity**

10. What changes have you seen in GSL and SRD?
  - a. How do you think water quality and quantity have changed?*
    - i. What do you think has caused these changes?*
  - b. What do you think are the biggest impacts on/threats to the waters of GSL and SRD presently?*
  - c. What do you think will be problems in the future?*
  - d. What is/are your biggest concern(s) about water change?*
11. How have these changes impacted you? How you use the SRD?
  - e. How have these changes/impacts made you feel?*
  - f. Do you feel your relationship with the SRD and GSL has changed because of [insert impacts mentioned by participant]?*
  - g. How well do you feel you can deal with these changes?*
12. If it gets worse, what will that mean for you?
  - h. What changes do you feel might be too much for you?*

### **Shared Meanings and Values**

13. Do you feel that other people in the community share the same feelings as you about [insert place]?
  - a. Do these places mean the same to others?*
  - b. What do you think that these shared [or divergent] meanings mean for the community as a whole?*
14. How do you feel about how other people use [insert specific area – can be both broad or general]?
15. In what ways do people work together to address water issues?
  - a. Why do you think this is?*

### **Action and Priorities**

16. What do you think should be done about the changes taking place in the SRD and GSL?
  - a. Do you think that these changes can be fixed?*
  - b. What do you think is the most important thing that needs to be addressed?*
  - c. Who do you think should be involved in planning for the region?*
    - i. i.e. community, regional government, territorial government*
  - d. Would you like to be involved? In what ways?*
  - e. What do you think you could do to help protect the region?*

## **Revised Interview Guide**

### **Context Questions**

1. Can you tell me a little about yourself?
  - a. How long have you lived in fort resolution?
  - b. Do you spend time on the SRD? Other areas?
2. Where is your favourite place? Can you tell me about it?

### **Values Questions**

3. What do you value most about the SRD?
  - a. What is most important to you about the delta?
  - b. What makes the SRD special?
4. In what ways is water important to you? To your community?

### **Self-identification questions**

5. Do you feel like the SRD is a part of who you are? In what ways?
  - a. What does your relationship with this place mean to you?
  - b. Is the SRD/being on the land an important part of your identity?
    - a. How would you say the relationship with land and water influences the identity of the people in this community?

### **Feelings and Attachment Questions**

6. Do you feel attached to the SRD?
7. How does being in this place make you feel?
  - a. Where do you feel most at home?
  - a. Where do you feel your best? Happiest?
  - b. Do you feel you can be yourself there?
  - c. Where do you feel most comfortable? Most safe and secure?
  - d. What do you like about living here?
  - e. Would you want to live anywhere else?
  - f. Do you think other place could offer you the same experiences?
8. When you are away from this place, how do you feel?
  - g. Do you miss being on the delta when you are away for a time?

9. In what ways is the SRD important for your overall well-being? Well-being of community members?

**Impacts from change/capacity**

10. I have heard a lot about changes taking place in the SRD. How do these changes/impacts make you feel?
- a. If the SRD disappeared, what would that mean for you?
  - b. Would you feel like you lost a part of yourself?
  - c. Do you feel your relationship with the SRD has changed because of impacts?
  - d. How have these changes impacted you? How you use the SRD?
11. If it gets worse, what will that mean for you?
- e. What changes do you feel might be too much for you?
  - f. How well do you feel you can deal with these changes?

**Shared values, actions and priorities questions**

12. Do you feel that other people in the community share the same meanings as you about this place?
- a. Do these places mean the same to others?
  - a. How do you feel about how other people use this area?
  - b. What do you think that these shared/divergent meanings mean for the community as a whole?
13. In what ways do people work together to address water issues? How does the community come together to deal with changes in the SRD?
14. Who do you think should be involved for planning for the region?
- a. In what ways do you feel you could contribute to protecting the SRD?
15. What do you want to SRD to be like for your (grand)children?

## APPENDIX I – Deninu Student Photo Essays

### *Appendix II – Grade 11-12 Students*

#### **The land and water - By Paul Boucher**



(Photo by Paul Boucher, Jr., 2011)

The land and water is very important to me. I use the land quite often. The land is very special to me. It's where the people came from. As I was growing up, people always told me to respect the land. Treat it with pride. As a land user I have seen changes on the water. The water level has dropped lots within the decade. Another concern I see is we are finding fish with abnormalities. These changes have a great impact on our community. A traditional food is getting destroyed because all these changes.



(Photo by Paul Boucher, Jr., 2011)



(Photo by Paul Boucher, Jr., 2011)

I love going out onto the land. I learn something new every time I go out on the land, either its traditional routes or survival skills. I've been out in the bush in all four seasons and every season is a different experience. One of the best parts about going on the land is the traditional foods. Right from moose meat to the berries. Why I go in the bush is to get away from town and also just to be out in the bush. There's always something to do out in the bush.



(Photo by Paul Boucher, Jr., 2011)

### Photo Essay by Shania Miersch

The water and land are very important to me because where I live, every time I turn my head that's I exactly what I see. Land and water, I enjoy spending my time looking at the beautiful things like those. Everything I do revolve around the land or water. The changes affect me because I do go fishing in the lake, which has been dropping since last year.



(Photo by Shania Miersch, 2011)

These changes make me feel like the world is ending. I begin to wonder what life will be like if this continues on? How will people in the future feel when they realize what life here used to be like? I think that we should try to help this problem be reduced. For the people of our future. They need to live our traditional life that we can live now, I believe that we will be able to let them live their life as we have lived ours.

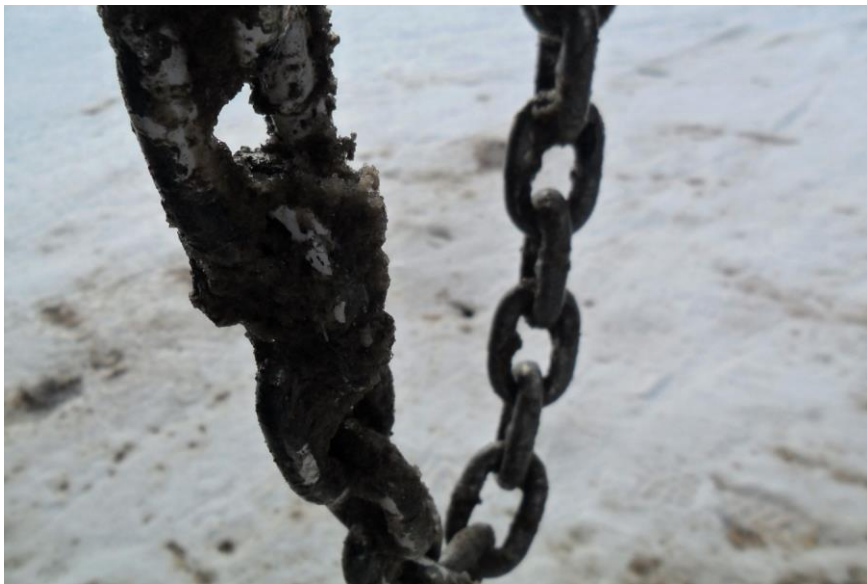


(Photo by Shania Miersch, 2011)





(Photo by Shania Miersch, 2011)



(Photo by Shania Miersch, 2011)

## Picture Essay

Why are water and the land important to me and my community? The wilderness is important because we can go hunting there, some animals that we enjoy hunting is ducks, geese, moose, muskrats, beavers and caribou. There are some good spots to go and hunt geese and ducks hunting for ducks is my favorite thing to do mostly because I get to wear waders they are a type of rubber boots they go up to your thighs so you can walk in low waters and not worry about getting wet.



Example of a place to go hunt a duck they are often in little ponds. (Photo by Anonymous, 2011)

I love going on the land because it is a great place to go with your friends to chill out. When I go out on the land with my friends we always go out on a boat. There is lots of nice scenery while being out on the water but unfortunately now days most of the channels are drying up the water is really low. It sucks because there are some places I have never been before and I don't know if I will ever get to see how it looks. We like to go fishing too it is a great activity that we do often in the summer time. I just love the land and showing of my traditional ways I always have a great time if you haven't been out on the land I suggest that you go because it is so worth it.



This is a photo of the frozen lake. (Photo by Anonymous, 2011)

Written by  
Anonymous Student

## Morgan's photo Essay<sup>36</sup>



Taltson bay (Photo by Morgan Unka, 2011)

This is one of the most beautiful places I know. The landscape is phenomenal, I never been anywhere so quiet and peaceful. Being away from Fort Resolution and being out on the land with your best friends is fun, even if it's just for a boat ride or the weekend. Since I just started going in the bush a lot this summer my Father bought me two guns so I could shot animals. It is a great experience learning the rivers and keeping our tradition strong. When I'm in the bush I like to take photos and try to pay attention to where we are. When I was fifteen I shot my first Moose it was a great experience to see how a Moose is skinned.



A Moose up river (Photo by Morgan Unka, 2011)

Some changes that I saw in the time I have been going out into the land. Is that people have noticed more sick animals, such as moose, birds and fish. I think this is a result to pollution and man made factories such the oil sands. The water has dropped in the Great Slave Land a lot, when you go to other places by boat you have to be careful and watch for sand bars. Also

---

<sup>36</sup> Note: Some photos are not included as they include faces of other young people from the community, and I was unable to obtain permission for inclusion of these photos.

places like where we shot this moose are difficult to get to. We went there this past summer and we had to get out of the boat and push. I thinking someday we will not be able to go in the boat anymore because if all the sand bar in our water now.



Ice on the lake



Taltson Bay



Butterfly in The Bush



My 308 gun

(Photos above by Morgan Unka, 2011)

When I move away and go to collage I will look back at my high school memories and never forget them. I will miss going in the bush when ever I feel like it. Having that freedom to live off the land and have my culture so close to me. I don't think people from the cities no what they are missing. What they could be doing, and have a totally different life than living in a city. I am so thankful that I have that connection with the land; I wish other people could have the connection that I have.

## **Myranda's Photo Essay**<sup>37</sup>

The water and land are important to me, because I could go hunting and learn my traditional ways on the land. This is part of my life because of my parents/grandparents went hunting and lived off of the land. I wouldn't mind on taking the tradition from my parents and then when I learn everything I could and then I could past it on to my kids when I have kids. The water and land are important to our community because that's where we get our drinking water and our water is our way of living. The land is important to our community because we can go out in the spring, fall and go hunting for our food so we don't have to spend so much money on the food from the store.

My specific place is Little Buffalo River, it is important to me because I am there almost every weekend other hunting, fishing or even trapping. I like being out on the land because I am away from town and it is quit out there and I like the peace and quit. What I like about being out on the water is I can go hunting for duck, geese and other types of birds that we could eat; I also like the water because I can go fishing and or set nets. I think the land and water are changing, like the water is dropping it like drop a lot within the past few years. It is important to me because the water is the source of going out on the land like hunting for moose and caribou and we also us the water so we can go fishing. Our land is a nice and beautiful place to go I would suggest you go out to Simpson Island or even Taltson River.

---

<sup>37</sup> Note: some students chose not to submit photos with their essays

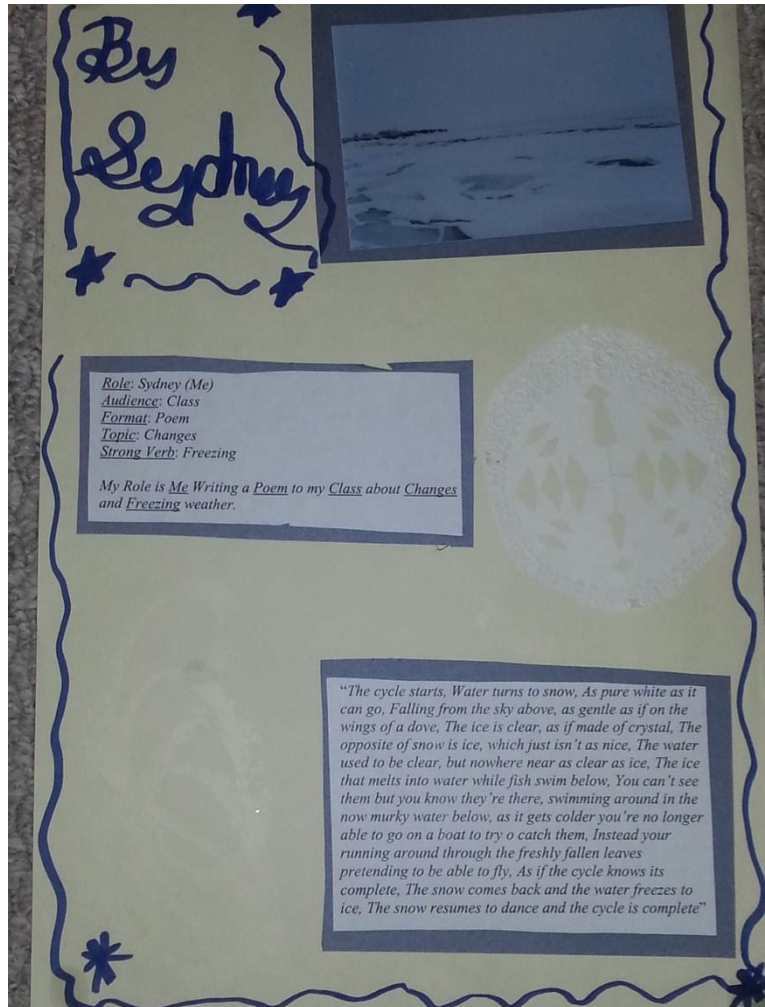
Appendix I2 – Grade 7-8 Class

**Submission by Sydney Bailey**

Role: Sydney (me)  
Audience: Class  
Format: Poem  
Topic: Changes  
Strong Verb: Freezing

My role is me writing a poem to my class about changes and freezing weather.

*“The cycle starts, Water turns to snow, As pure white as it can go, Falling from the sky above, as gentle as if on the wings of a dove, The ice is clear, as if made of crystal, the opposite of snow is ice, which just isn’t as nice, The water used to be clear , but nowhere near as clear as ice, The ice that melts into water while fish swim below, You can’t see them but you know they’re there, swimming around in the now murky water below, as it gets colder you’re no longer able to go on a boat to try and catch them, Instead [you’re] running around in freshly falling leaves pretending to be able to fly, As if the cycle knows its complete, The snow comes back and the water freezes to ice, The snow resumes to dance and the cycle is complete”*



## Submission by Macheala Larocque

Role: Santa

Audience: Gingerbread men

Format: letter

Topic: snow melting, because of global warming

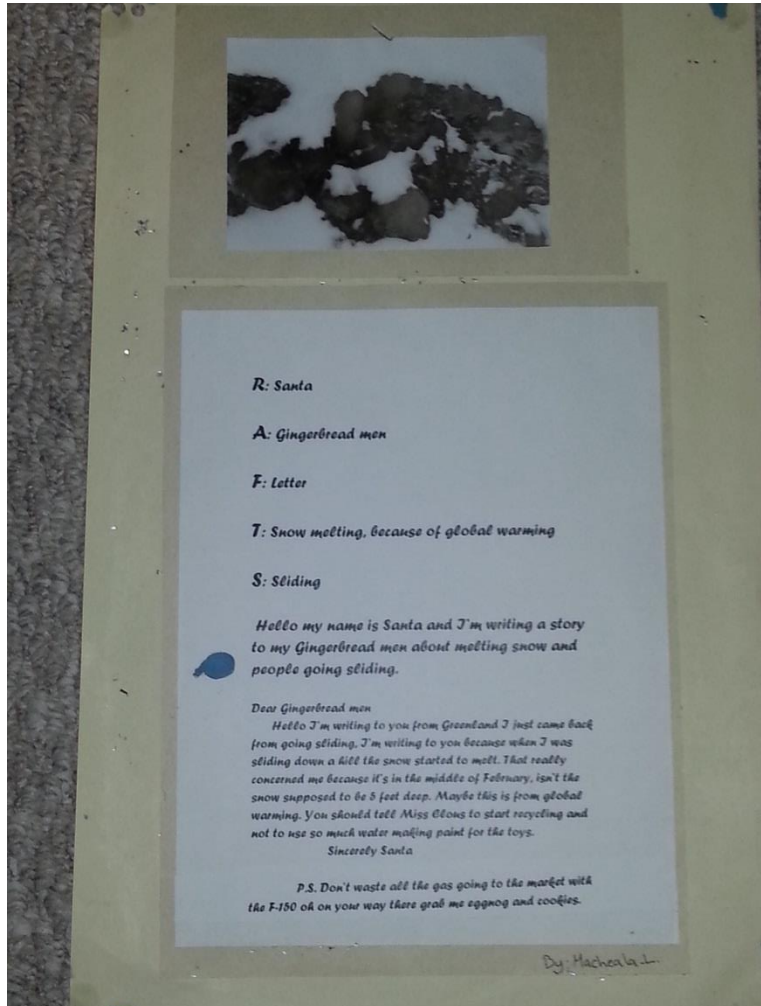
Strong verb: sliding

Hello my name is Santa, and I'm writing a story to my Gingerbread men about melting snow and people going sliding.

*“Dear Gingerbread men,  
Hello, I'm writing to you from Greenland, I just came back from going sliding. I'm writing to you because when I was sliding down a hill the snow started to melt. That really concerned me because it's in the middle of February, isn't the snow supposed to be 5 feet deep. Maybe this is from global warming. You should tell Mrs. Claus to start recycling and not to use so much water making paint for the toys.*

*Sincerely Santa*

*P.S. Don't waste all the gas going to the market with the F-150, oh on your way there grab me eggnog and cookies.”*





## Submission by Nicole Enge

Role: Freddy the Fish  
Audience: News North Journalist  
Format: Newspaper article  
Topic: Environmental change  
Strong verb: Changing

Freddy the Fish was asked to be in an interview with a News North Journalist for an article about how the environment is changing and how the water levels [are] going down.

*“Uh Katie, the camera’s going to roll in 3, 2 1 GO-*

*Katie: Hi my name is Katie O’Leary and I’m here in Fort Resolution interviewing Freddy the Fish. Tell me Freddy, what do you know or experienced about water in the North?*

*Freddy: Well, I noticed that the water levels are going down. I used to swim along the arbor<sup>38</sup> but no I’m too scared about the rocks and sandbars.*

*Katie: Really? I didn’t realize that even Fort Resolution was affected.*

*Freddy: Yes, it’s been a very dramatic change, I think once my grandma-fish told me there’s a dam in Alberta or B.C. which is blocking the flow to the Great Lakes and many rivers in the NWT.*

*Katie: What’s the most shocking thing you’ve heard about the water?*

*Freddy: Well, I’m disgusted by the Oil Sands in Alberta they’re hogging all the water, dumping dangerous chemicals, in the Athabasca River. Once, it killed my good friend Blubby. And my cousin Krey got mutated by the chemicals and got two heads! He also died. It’s sad what people are doing these days. You know the Athabasca River flows into many rivers and eventually flows into Great Slave Lake, the water we drink from.*

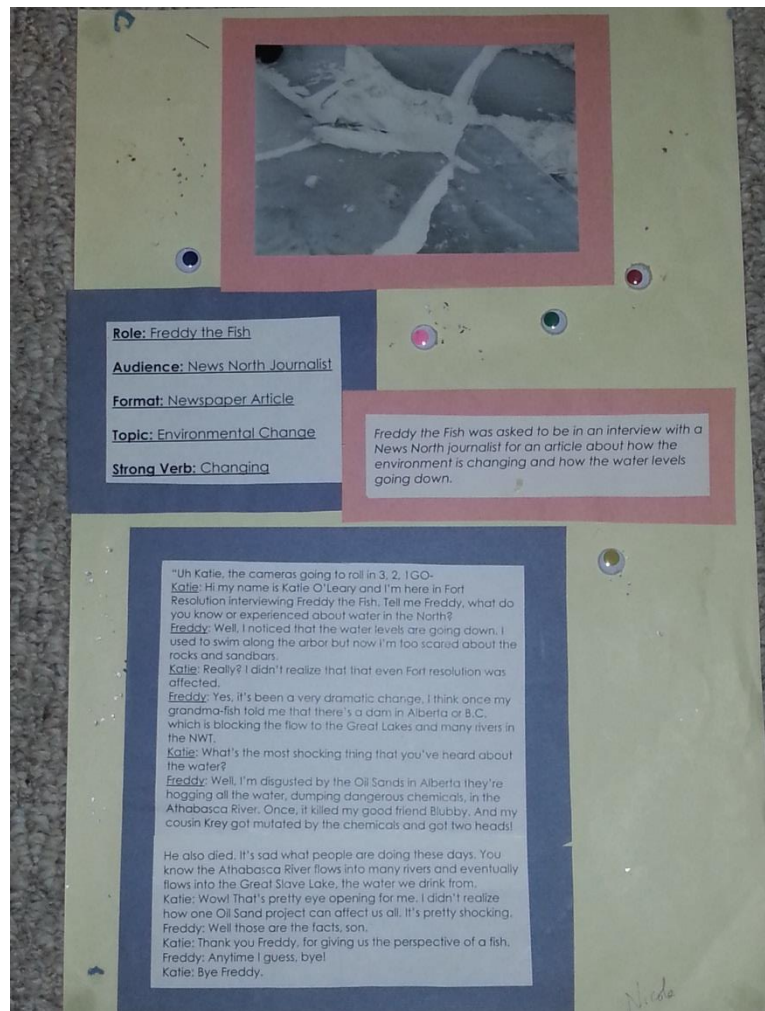
*Katie: Wow! That’s pretty eye opening for me. I didn’t realize how one Oil Sand project can affect us all. It’s pretty shocking.*

*Freddy: Well those are the facts, son.*

*Katie: Thank you Freddy, for giving us the perspective of a fish.*

*Freddy: Any time I guess, bye!*

*Katie: Bye Freddy.”*



<sup>38</sup> The arbor is a community structure in Fort Resolution, located on the shores of Great Slave Lake.

## Submission by Keenan Hunter

Role: Keenan

Audience: Family

Format: Story

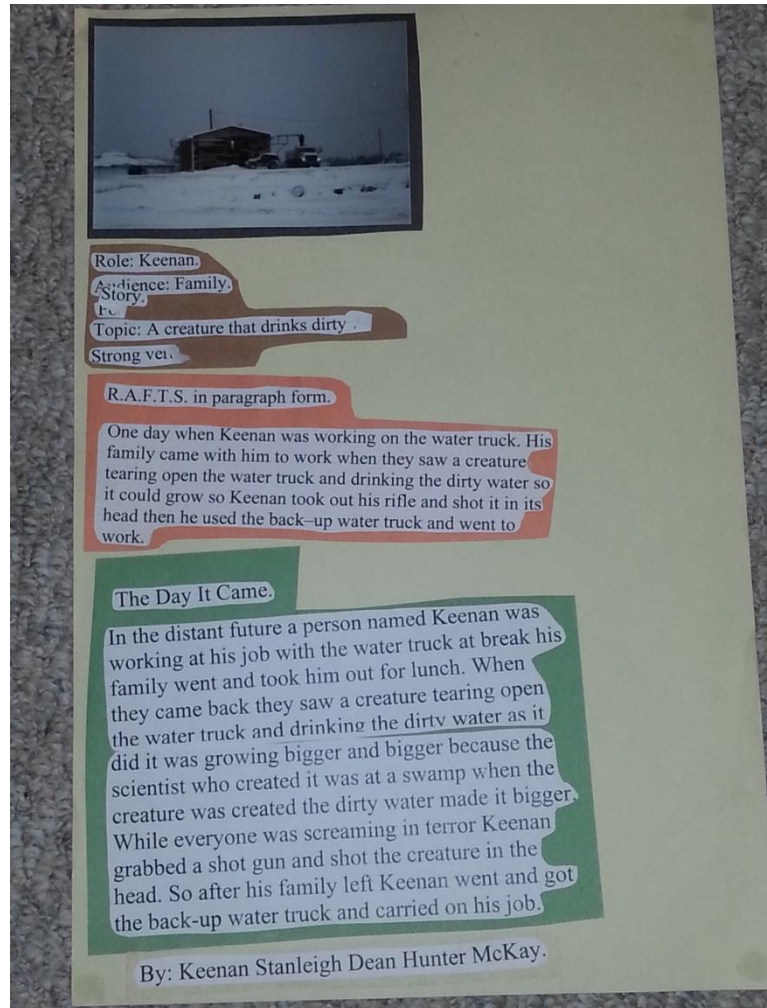
Topic: A creature that drinks dirty water

R.A.F.T.S. in paragraph form.

One day when Keenan was working on the water truck. His family came with him to work when they saw a creature tearing open the water truck and drinking dirty water so it could grow so Keenan took out his rifle and shot it in its head then he used the back-up water truck and went to work.

*“The Day It Came.*

*In the distant future a person named Keenan was working at his job on the water truck at break his family went and took him out for lunch. When they came back they saw a creature tearing open the water truck and drinking the dirty water as it did it was growing bigger and bigger because the scientist who created it was at a swamp when the creature was created the dirty water made it bigger. While everyone was screaming in terror Keenan grabbed a shot gun and shot the creature in the head. So after his family left Keenan went and got the back-up water truck and carried on his job.”*



## REFERENCES

- Aakvaag, M.F. (2013). *Vulnerable or capable? Adolescent girls and vulnerability to climate risks. A case study from El Salvador*. Unpublished Masters Thesis. University of Oslo.
- Aboriginal Affairs and Northern Development Canada and Government of the Northwest Territories. (2010). *Northern Voices, Northern Waters: NWT Water Stewardship Strategy*. Yellowknife: Environment and Natural Resources, GNWT.
- Aboriginal Affairs and Northern Development Canada and Government of the Northwest Territories. (2012). *Our water, our life: Building partnerships to assess the health of the Slave River and Slave River Delta. Summary report for the community workshop convened in Fort Smith, NWT on March 1 and 2, 2011*. Yellowknife, NT: AANDC/GNWT.
- Adger, W.N. (2003). Social capital, collective action, and adaptation to climate change. *Economic Geography*, 79, 387–404.
- Adger, W.N. (2005). Social-ecological resilience to coastal disasters. *Science*, 309(5737), 1036-1039.
- Adger, W.N. (2006). Vulnerability. *Global Environmental Change*, 16(3), 268-281.
- Adger, W.N., Arnell, N.W. & Tompkins, E.L. (2005). Adapting to climate change: perspectives across scales. *Global Environmental Change*, 15(2), 75-76.
- Adger, W.N., Barnett, J., Brown, K., O'Brien, K. & Marshall, N. (2013). Cultural dimensions of climate change impacts and adaptation. *Nature Climate Change*, 3(2), 112-117.
- Adger, W.N., Barnett, J., Chapin III, F.S. & Ellemor, H. (2011). This must be the place: underrepresentation of identity and meaning in climate change decision-making. *Global Environmental Politics*, 11(2), 1-25.
- Adger, W.N., Brooks, N., Bentham, G., Agnew, M. & Eriksen, S. (2004). *New Indicators of Vulnerability and Adaptive Capacity*. Technical Report 7, Tyndall Centre for Climate Change Research, University of East Anglia, Norwich.
- Adger, W.N., Dessai, S., Goulden, M., Hulme, M., Lorenzoni, I., Nelson, D.R., Naess, L.O., Wolf, J. & Wreford, A. (2009). Are there social limits to adaptation to climate change? *Climatic Change*, 93, 335–354.
- Adger, W.N., Huq, S., Brown, K., Conway, D. & Hulme, M. (2003). Adaptation to climate change in the developing world. *Progress in Development Studies*, 3(3), 179-195.
- Adger, N. & Kelly, M. (1999). Social Vulnerability to Climate Change and the Architecture of Entitlements. *Mitigation and Adaptation Strategies for Global Change*, 4, 253 – 266.
- Adger, W.N., Paavola, J. & Huq, S. (2006). Toward justice in adaptation to climate change. In W.N. Adger, J. Paavola, S. Huq & M.J. Mace (eds), *Fairness in adaptation to climate change*. Cambridge, MIT Press.
- Adger, W.N. & Vincent, K. (2005). Uncertainty in adaptive capacity. *Comptes Rendus Geoscience*, 337(4), 399-410.
- Agnew, J. (1987). *Place and Politics: The Geographical Mediation of State and Society*. Boston, MA: Allen & Unwin.
- Akaitcho Territory Government. (2009). Akaitcho Territory Map. Accessed December 7, 2014, from <http://www.akaitchoterritory.com/AkaitchoMap.aspx>.
- Akaitcho Territory Government. (2008). *Tu Beta Ts'ena, "Water is Life"*. Video Produced by Akaitcho Territory Dene First Nations.

- Alaska Native Science Commission (n.d.). *What is traditional knowledge?* [online]. Accessed May 18, 2014 from <http://www.nativescience.org/issues/tk.htm>
- American Psychological Association. *Psychology & global climate change: addressing a multifaceted phenomenon and set of challenges. A report of the American Psychological Association Task Force on the Interface between Psychology and Global Climate Change*; 2010, 108 pp. Available at: <http://www.apa.org/science/about/publications/climate-changebooklet.pdf> (Accessed September 8, 2011).
- Andrachuk, M. & Pearce, T. (2010). Vulnerability and adaptation in two communities in the Inuvialuit Settlement Region. In Hovelsrud, G.K. & Smit, B. (eds), *Community adaptation and vulnerability in arctic regions* (pp. 63-82). Dordrecht: Springer.
- Anonymous. (2010a). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Anonymous. (2010b). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Anonymous. (2010c). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Anonymous. (2011a). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Anonymous. (2011b). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Anonymous. (2011c). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Anonymous. (2011d). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Anonymous. (2011e). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Anonymous. (2011f). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Anonymous. (2011g). *Personal communication – photo essay*. Fort Resolution, NT, Canada.
- Anonymous. (2011h). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Armitage, D. (2005). Adaptive Capacity and Community Based Natural Resource Management, *Environmental Management*, 35(6), 703-715.
- Armitage, D. (2007). Building resilience livelihoods through adaptive co-management: The role of adaptive capacity. In Armitage, D., Berkes, F. & Doubleday, N. (eds), *Adaptive Co-Management: Collaboration, Learning and Multi-Level Governance* (pp.62-82). Vancouver: UBC Press.
- Armitage, D., Berkes, F., Dale, A., Kocho-Schellenberg, E. & Patton, E. (2011). Co-management and the co-production of knowledge: Learning to adapt in Canada's Arctic. *Global Environmental Change*, 21(3), 995-1004.
- Armitage, D., Marschke, M. & Plummer, R. (2008). Adaptive co-management and the paradox of learning. *Global Environmental Change*, 18(1), 86-98.
- Athabasca Chipewyan First Nation. (2012). *Fort Chipewyan community alarmed: Two deformed and lesion covered fish caught in Lake Athabasca*. Vancouver Media Co-op [online edition], May 31, 2012. Accessed from <http://vancouver.mediacoop.ca/newsrelease/11159>
- Bandura, A. (1986). *Social Foundations of Thought and Action*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (2001). Social cognitive theory: an agentic perspective. *Annual Review of Psychology*, 52, 1–26.
- Baxter, P. & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The qualitative report*, 13(4), 544-559.
- B.C. Hydro (2012). *Site C Clean Energy Project* [online]. Accessed October 20, 2013. Available from [http://www.bchydro.com/energy-in-bc/projects/site\\_c.html?WT.mc\\_id=rd\\_sitec](http://www.bchydro.com/energy-in-bc/projects/site_c.html?WT.mc_id=rd_sitec)
- Beaulieu, A. (2010). *Personal communication – interview*. Fort Resolution, NT, Canada.

- Beaulieu, E. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Beaulieu, H. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Beaulieu, Leandre. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Beaulieu, Leonard. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Beaulieu, R. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Beaulieu, W. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Bebbington, A., Abramovay, R. & Chiriboga, M. (2008). Social movements and the dynamics of rural territorial development in Latin America. *World Development*, 36, 2874–2887.
- Beck, A. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Beck, D. (2010). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Beckley, T., Parkins, J. & Stedman, R. (2002). Indicators of forest-dependent community sustainability: The evolution of research. *Forestry Chronicle*, 78(5), 626–636.
- Berger, A.R. & Liverman, D.G. (2008). Introduction: Rapid landscape change and human responses in the Arctic and Subarctic. *Northern Review*, 28, 8-14.
- Berkes, F. (2008). *Sacred ecology* (2<sup>nd</sup> ed.). New York: Routledge.
- Berkes, F., & Armitage, D. (2010). Co-management institutions, knowledge, and learning: Adapting to change in the Arctic. *Études/Inuit/Studies*, 34(1), 109-131.
- Berkes, F. & Jolly, D. (2002). Adapting to climate change: social-ecological resilience in a Canadian western Arctic community. *Conservation Ecology*, 5(2), 18.
- Berkhout, F., Hertin, J. & Gann, D.M. (2006). Learning to adapt: organisational adaptation to climate change impacts. *Climatic Change*, 78(1), 135-156.
- Berrang-Ford, L., Ford, J.D. & Paterson, J. (2011). Are we adapting to climate change? *Global Environmental Change*, 21(1), 25-33.
- Bianchi, E. (2006). *Report on the Tu Cho International Indigenous Water Rights Conference*, Yellowknife, NWT, June 21-23, 2006. Report Prepared for Akaitcho.
- Bodin, Ö., Crona, B. & Ernstson, H. (2006). Social networks in natural resource management: what is there to learn from a structural perspective. *Ecology and Society*, 11(2), r2.
- Bodner, G.M. (1986). Constructivism: A theory of knowledge. *Journal of Chemical Education* 63(10), 873-878.
- Boucher, C. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Boucher, P. (2011). *Personal communication – photo essay*. Fort Resolution, NT, Canada.
- Brock, B.E., Wolfe, B.B. & Edwards, T.W.D. (2007). Characterizing the hydrology of shallow floodplain lakes in the Slave River Delta, NWT, Canada, using water isotope tracers. *Arctic, Antarctic and Alpine Research*, 39(3), 388-401.
- Brock, B.E., Martin, M.E., Mongeon, C.L., Sokal, M.A., Wesche, S.D., Wolfe, B.B., Hall, R.I., Armitage, D.R., & Edwards, T.W.D. (2010). Flood frequency variability in the Slave River Delta, NWT, over the past 80 years from multiproxy paleolimnological analysis. *Canadian Water Resources Journal*, 35(3), 281-300.
- Brooks, N. (2003). Vulnerability, risk and adaptation: A conceptual framework. Working Paper 38, Tyndall Centre for Climate Change Research, University of East Anglia, Norwich.
- Brown, B.B. & Perkins, D.D. (1992). Disruptions in place attachment. In I. Altman & S.M. Low (eds), *Place Attachment*. New York: Plenum Press.
- Brown, B., Perkins, D.D. & Brown, G. (2003). Place attachment in a revitalizing neighborhood: Individual and block levels of analysis. *Journal of environmental psychology*, 23(3), 259-271.

- Bricker, K. & Kerstetter, D. (2002). An interpretation of special place meanings whitewater recreationists attach to the South Fork of the American River. *Tourism Geographies*, 4, 396–425.
- Brown, B.B., & Werner, C.M. (1985). Social cohesiveness, territoriality, and holiday decorations: The influence of cul-de-sacs. *Environment and Behavior*, 17(5), 539-565.
- Burton, I., Kates, R.W. & White, G.F. (1978). *The environment as hazard*. New York: Oxford University Press.
- Buttimer, A. & Seamon, D. (eds) (1980). *The human experience of space and place*. London: Croom Helm.
- Calumet, M. (2011). *Personal communication – photo essay*. Fort Resolution, NT, Canada.
- Cantrill, J.G. & Senecah, S.L. (2001). Using the ‘sense of self-in-place’ construct in the context of environmental policy-making and landscape planning. *Environmental Science & Policy*, 4(4), 185-203.
- Castree, N. (2003). Place: connections and boundaries in an interdependent world. In Holloway, S.L., Rive, S.P. & Valentine, G. (eds), *Key concepts in geography* (pp. 165-186). Thousand Oaks: Sage.
- CBC News North. (2008). *NWT officials echo concerns about Alberta oilsands’ impact on birds*. CBC News North [online edition], December 4, 2008. Accessed from <http://www.cbc.ca/news/canada/north/n-w-t-officials-echo-concerns-about-alberta-oilsands-impact-on-birds-1.756078?ref=rss>
- CBC News North. (2011). *Taltson hydro expansion put on hold*. CBC News North [online edition], March 2, 2011. Accessed from <http://www.cbc.ca/news/canada/north/taltson-hydro-expansion-put-on-hold-1.1027782>
- CBC News Edmonton. (2010). *Oilsands poisoning fish, say scientists, fishermen*. CBC News Edmonton [online edition], September 16, 2010. Accessed from <http://www.cbc.ca/news/canada/edmonton/oilsands-poisoning-fish-say-scientists-fishermen-1.939507>
- Chambers, R. & Conway, G. (1992). *Sustainable rural livelihoods: practical concepts for the 21st century*. Institute of Development Studies (UK).
- Cheng, A.S, Kruger, L.E. & Daniels, S.E. (2003). “Place” as an integrating concept in natural resource politics: Propositions for a social science research agenda. *Society & Natural Resources*, 16, 87–104.
- Chow, K. & Healey, M. (2008). Place attachment and place identity: First-year undergraduates making the transition from home to university. *Journal of Environmental Psychology*, 28, 362–372.
- Creswell, J.W. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks: Sage Publications.
- Creswell, J.W. (2003). *Research design: Qualitative, quantitative and mixed methods approaches* (2nd. Ed.). Thousand Oaks: Sage.
- Cresswell, T. (2004). *Place: A short introduction*. Malden, MA: Blackwell Publishing.
- Conway, J.M. (2004). *Identity, place, and knowledge: Social movements and contesting globalization*. Halifax: Fernwood Publishing.
- Cuba, L. & Hummon, D.M. (1993). A place to call home: identification with dwelling, community, region. *The Sociological Quarterly*, 34, 111-131.

- Davenport, M. & Anderson, D. (2005). Getting from sense of place to place-based management: an interpretive investigation of place meanings and perceptions of landscape change. *Society & Natural Resources*, 18, 625–641.
- Davenport, M.A., Leahy, J.E., Anderson, D.H. & Jakes, P.J. (2007). Building trust in natural resource management within local communities: a case study of the Midewin National Tallgrass Prairie. *Environmental management*, 39(3), 353-368.
- De la Barre, S. (2009). Place identity, guides and sustainable tourism in Canada's Yukon Territory. Unpublished PhD dissertation, University of Alberta.
- DeMiglio, L. & Williams, A. (2008). A sense of place, a sense of well-being. In J. Eyles, A. Williams (eds.), *Sense of place, health and quality of life* (pp. 15-30). Aldershot: Ashgate.
- Deninu Ku'e First Nation. (n.d.). *Presentation to Mackenzie Valley Environmental Impact Review Board for: UR Energy's application to conduct a uranium exploration project at Screech Lake in the Thelon River Basin and the Traditional Territory of the Akaitcho Dene First Nation*. Retrieved April 6, 2009, from [http://www.mveirb.nt.ca/upload/project\\_document/1169654589\\_Deninu%20Kue%20Firs%20Nation%20UR%20ENERGY%20Presentation.pdf](http://www.mveirb.nt.ca/upload/project_document/1169654589_Deninu%20Kue%20Firs%20Nation%20UR%20ENERGY%20Presentation.pdf)
- Delorme, J. (2010). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Delorme, K. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Delorme, T. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Delorme, V. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Delorme, W. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Deze Energy. (n.d). *Taltson Project* [online]. Accessed October 20, 2013. Available from [http://www.deze.ca/taltson\\_project/index.html](http://www.deze.ca/taltson_project/index.html)
- Diduck, A. (2010). The learning dimension of adaptive capacity: Untangling the multi-level connections. In D. Armitage & R. Plummer (eds), *Adaptive capacity and environmental governance* (pp. 199-222). Berlin: Springer.
- Dillon, J. & Reid, A. (2004). Issues in case-study methodology in investigating environmental and sustainability issues in higher education: towards a problem-based approach? *Environmental Education Research*, 10(1), 23-37.
- Dixon, J. & Durrheim, K. (2000). Displacing place-identity. *British Journal of Social Psychology*, 39, 27–44.
- Doucet, A. & Mauthner, N. (2008). Qualitative interviewing and feminist research. In Alasuutari, P., Bickman, L. & Brannen, J. (eds), *The Sage Handbook of Social Research Methods* (pp. 328-343). Los Angeles, CA: Sage Publications.
- Dow, K. (1992). Exploring differences in our common future(s): The meaning of vulnerability to global environmental change. *Geoforum*, 23, 417–436.
- Dow, K., Kasperson, R.E. & Bohn, M. (2006). Exploring the social justice implications of adaptation and vulnerability. In Adger, W.N, Paavola, J., Huq, S. & Mace, M.J. (eds), *Fairness in adaptation to climate change* (pp. 79-96). Cambridge, MA: MIT Press.
- Denzin, N. (1978). *The research act: A theoretical introduction to sociological methods*. New York: McGraw-Hill.
- Denzin, N. K. & Lincoln, Y. S. (1994). Introduction: Entering the field of qualitative research. In N. K. Denzin & Y. S. Lincoln. (eds). *Handbook of qualitative research*. Thousand Oaks, CA: Sage.

- Devine-Wright, P. (2009). Rethinking NIMBYism: The role of place attachment and place identity in explaining place-protective action. *Journal of Community & Applied Social Psychology*, 19(6), 426-441.
- Devine-Wright, P. (2013). Think global, act local? The relevance of place attachments and place identities in a climate changed world. *Global Environmental Change*, 23(1), 61-69.
- Droseltis, O. & Vignoles, V. L. (2010). Towards an integrative model of place identification: Dimensionality and predictors of intrapersonal-level place preferences. *Journal of Environmental Psychology*, 30(1), 23-34.
- Ebi, K.L. & Semenza, J.C. (2008). Community-based adaptation to the health impacts of climate change. *American Journal of Preventative Medicine*, 35, 501–507.
- Ellis, S. C. (2005). Meaningful consideration? A review of traditional knowledge in environmental decision making. *Arctic*, 66-77.
- Enge, N. (2010). *Personal communication – photo essay*. Fort Resolution, NT, Canada.
- English, M.C., Hill, R.B., Stone, M.A. & Ormson, R. (1997). Geomorphological and botanical change on the outer Slave River Delta, NWT, before and after impoundment of the Peace River. *Hydrological Processes*, 11, 1707-1724.
- Entrikin, J. N. (1996). Place and region 2. *Progress in Human Geography*, 20(2), 215-221.
- Eyles, J. & Williams, A. (2008). Introduction. In: Eyles, J. & Williams, A. (eds), *Sense of Place, Health and Quality of Life* (pp. 1-14). Aldershot: Ashgate.
- Fabien, L. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Fabricius, C., Folke, C., Cundill, G., & Schultz, L. (2007). Powerless spectators, coping actors, and adaptive co-managers: a synthesis of the role of communities in ecosystem management. *Ecology and Society*, 12(1), 29.
- Fankhauser, S., Smith, J.B. & Tol, R.S. (1999). Weathering climate change: some simple rules to guide adaptation decisions. *Ecological Economics*, 30(1), 67-78.
- Fankhauser, S., Tol, R.S. & Pearce, D.W. (1997). The aggregation of climate change damages: a welfare theoretic approach. *Environmental and Resource Economics*, 10(3), 249-266.
- Flyvbjerg, B. (2006). Five misunderstandings about case-study research. *Qualitative Inquiry*, 12(2), 219-245.
- Folke C., Colding, J. & Berkes, F. (2002). Building resilience for adaptive capacity in social-ecological systems. In: Berkes F., Colding, J. & Folke, C. (eds), *Navigating Social-Ecological Systems: Building Resilience for Complexity and Change*. Cambridge, UK: Cambridge University Press.
- Folke, C., Hahn, T., Olsson, P. & Norberg, J. (2005). Adaptive governance of social–ecological systems. *Annual Review of Environment and Resources*, 30, 441–473.
- Focus Group Participants. (2011). *Personal communication – focus group*. Fort Resolution, NT, Canada.
- Ford, J.D., Bell, T., and St-Hilaire-Gravel, D. (2010). Vulnerability of community infrastructure to climate change in Nunavut: A case study from Arctic Bay. In Hovelsrud, G.K. & Smit, B. (eds), *Community adaptation and vulnerability in arctic regions* (pp. 107-130). Dordrecht: Springer.
- Ford, J.D., Berrang-Ford, L., King, M. & Furgal, C. (2010). Vulnerability of aboriginal health systems in Canada to climate change. *Global Environmental Change*, 20(4), 668-80.
- Ford, J., Pearce, T., Smit, B., Wandel, J., Allurut, M., Shappa, K. & Qrunnut, K. (2008). Reducing vulnerability to climate change in the Arctic: the case of Nunavut, Canada. *Arctic*, 150-166.



- Ford, J. D., & Smit, B. (2004). A framework for assessing the vulnerability of communities in the Canadian Arctic to risks associated with climate change. *Arctic*, 57(4), 389–400.
- Freeman, R. (2008). *Historical overview of the Richer River/Taltson River/Tazin River areas of the Northwest Territories and Northern Saskatchewan and the Tazin River water diversion*. Report prepared for Deze Energy Corporation, Yellowknife, NT.
- Fresque-Baxter, J.A., & Armitage, D. (2012). Place identity and climate change adaptation: A synthesis and framework for understanding. *Wiley Interdisciplinary Reviews: Climate Change*, 3(3), 251-266.
- Fresque-Baxter, J.A. (2013). Participatory photography as a means to explore young people's experiences of water resource change. *Indigenous Policy Journal*, 23(4).
- Fried, M. (1963). Grieving for a lost home. In Duhl, J. (ed), *The Urban Condition: People and Policy in the Metropolis*. New York: Simon Schuster.
- Fullilove, M. T. (1996). Psychiatric implications of displacement: Contributions from the psychology of place. *The American Journal of Psychiatry*, 153(12), 1516-1523.
- Furgal, C. & Prowse, T., 2008. Northern Canada. In: Lemmen, D., Warren, F., Bush, E., Lacroix, J. (eds), *From impacts to adaptation: Canada in a changing climate 2007*. Natural Resources Canada, Ottawa.
- Furgal, C.M., Powell, S. & Myers, H. (2005). Digesting the Message about contaminants in the Canadian North: Review and recommendations for future research and action. *Arctic*, 58(2): 103-114.
- Furgal, C., & Seguin, J. (2006). Climate change, health, and vulnerability in Canadian Northern Aboriginal communities. *Environmental Health Perspectives*, 114(12), 1964.
- Fussel, H.M. (2007). Vulnerability: A generally applicable conceptual framework for climate change research. *Global Environmental Change*, 17, 155-167.
- Gardner, J. T., English, M. C., & Prowse, T. D. (2006). Wind-forced seiche events on Great Slave Lake: hydrologic implications for the Slave River Delta, NWT, Canada. *Hydrological Processes*, 20(19), 4051-4072.
- Gauthier, S. et al. (2014). Climate change vulnerability and adaptation in the managed Canadian boreal forest. *Environmental Reviews*, [online article]. DOI: 10.1139/er-2013-0064. Accessed May 18, 2014 from <http://www.nrcresearchpress.com/toc/er/0/0>
- Gearheard, S. & Shirley, J. (2007). Challenges in community-research relationships: learning from natural science in Nunavut. *Arctic*, 60(1), 62–74.
- Giroux, D. (2010). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Giroux, R. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Gibson, J., Prowse, T. & Peters, D. (2006). Partitioning impacts of climate and regulation on water level variability in Great Slave Lake. *Journal of Hydrology*, 329(1-2), 196-206.
- GNWT. (2008). *NWT climate change impacts and adaptation report*. NWT: GNWT.
- GNWT. (2009). *State of the environment report: Climate and weather* [online]. Accessed October 14, 2013 from [http://www.enr.gov.nt.ca/live/pages/wpPages/soe\\_climate.aspx#1](http://www.enr.gov.nt.ca/live/pages/wpPages/soe_climate.aspx#1)
- GNWT. (2013). *Bringing water quality results back to your community: 2012 results from the NWT-wide community-based water quality monitoring program* [online]. Accessed May 24, 2014 from <http://nwtwaterstewardship.ca/sites/default/files/CBM%20Booklet%202012%20WebReady.pdf>

- Gray, B. (1989). *Collaborating: Finding common ground for multiparty problems*. San Francisco: Jossey-Bass.
- Grothmann, T., Grecksch, K., Wings, M. & Siebenhüner, B. (2013). Assessing institutional capacities to adapt to climate change: integrating psychological dimensions in the Adaptive Capacity Wheel. *Natural Hazards and Earth System Science*, 13(12), 3369-3384.
- Grothmann, T. & Patt, A. (2005). Adaptive capacity and human cognition: The process of individual adaptation to climate change. *Global Environmental Change*, 15, 199-213.
- Gruenewald, D.A. (2003). The best of both worlds: A critical pedagogy of place. *Educational Researcher*, 32(4), 3-12.
- Guba, E.G. & Lincoln, Y.S. (1994). Competing paradigms in qualitative research. In N.K. Denzin & Y.S. Lincoln (eds), *Handbook of qualitative research* (pp.105-117). Thousand Oaks: Sage.
- Gustafson, P. (2001). Roots and routes: Exploring the relationship between place attachment and mobility. *Environment and Behavior*, 33(5), 667-686.
- Hall, R.I., Wolfe, B.B., Wiklund, J.A., Edwards, T.W., Farwell, A.J. & Dixon, D.G. (2012). Has Alberta oil sands development altered delivery of polycyclic aromatic compounds to the Peace-Athabasca Delta?. *PloS one*, 7(9), e46089.
- Hay R. (1998). A rooted sense of place in cross-cultural perspective. *The Canadian Geographer*, 42, 245–266.
- Harvey. D. (1996). *Justice, nature and the geography of difference*. Cambridge, MA: Blackwell Publishers.
- Hernandez, B., Carmen Hidalgo, M., Salazar-Laplace, M.E. & Hess, S. (2007). Place attachment and place identity in natives and non-natives. *Journal of Environmental Psychology*, 27, 310–319.
- Heyd, T. (2008). Landscape change, respect and responsibility. *Northern Review*, 28, 95-110.
- Hidalgo. M. & Hernandez, B. (2001). Place attachment: Conceptual and empirical questions. *Journal of Environmental Psychology*, 21, 273–281.
- Hinkel, J. (2011). Indicators of vulnerability and adaptive capacity: Towards a clarification of the science–policy interface. *Global Environmental Change*, 21(1), 198-208.
- Holling, C.S. & Gunderson, L.H. (2002). Resilience and adaptive cycles. In Gunderson, L.H. & Holling, C.S. (eds), *Panarchy: understanding transformations in human and natural systems* (25-62). Washington, D.C.: Island Press.
- Horner, D. (2010). *First Nations concerned oil sands may be causing cancer*. The Calgary Journal [online edition], April 3. 2010. Accessed October 14, 2013, from <http://www.calgaryjournalonline.ca/news/34-news/1162-doug-horner>
- Horwitz, P., Lindsay, M. & O'Connor M. (2001). Biodiversity, endemism, sense of place, and public health: interrelationships for Australian inland aquatic systems. *Ecosystem Health*, 7, 253–265.
- Howitt, R. & Stevens, S. (2005). Cross-cultural research: Ethics, methods, and relationships. In Hay, I. (ed), *Qualitative methods in human geography* (2nd ed.). Melbourne, Australia: Oxford University Press.
- Hovelsrud, G.K., Dannevig, H., West, J. & Amundsen, H. (2010). Adaptation in fisheries and municipalities: Three communities in northern Norway. In Hovelsrud, G.K. & Smit, B. (eds), *Community adaptation and vulnerability in arctic regions* (pp. 23-62). Dordrecht: Springer.

- Hume, M. (2012). *Fearing water pollution, NWT towns call for oil sands slowdown*. The Globe and Mail [online edition], August 23, 2013. Accessed October 14, 2013 from [http://m.theglobeandmail.com/news/national/fearing-water-pollution-nwt-towns-call-for-oil-sands-slowdown/article1154313/comments/?service=mobile&tabInside\\_tab=0&page=0#!/](http://m.theglobeandmail.com/news/national/fearing-water-pollution-nwt-towns-call-for-oil-sands-slowdown/article1154313/comments/?service=mobile&tabInside_tab=0&page=0#!/)
- Hunter, M.C. (2008). Mitigation, adaptation, uncertainty—managing sense of place in transition: Coping with climate change. *Places*, 20(2).
- Hunter, K. (2011). *Personal communication – photo essay*. Fort Resolution, NT, Canada.
- Huntington, H. & Fox, S. (2005). The changing Arctic: indigenous perspectives. In: *Arctic Climate Impact Assessment* (pp. 61-98). Cambridge, UK: Cambridge University Press.
- Indian and Northern Affairs Canada. (n.d.). *Akaitcho Process*. Accessed December 7, 2014 from [http://www.daair.gov.nt.ca/\\_live/documents/content/Akaitcho\\_QuickFacts.eng.pdf](http://www.daair.gov.nt.ca/_live/documents/content/Akaitcho_QuickFacts.eng.pdf).
- Inhalan, G. & Finch, E. (2004). Place attachment and sense of belonging. *Facilities*, 22, 120–128.
- Intergovernmental Panel on Climate Change. (2007). *Climate Change 2007 – Impacts, Adaptation and Vulnerability*. Contribution of Working Group II to the Fourth Assessment Report of the IPCC. Cambridge University Press.
- International Human Dimensions Programme on Global Environmental Change. (2012). *Vulnerability, resilience and adaptation* [online]. Accessed May 18, 2014, from <http://www.ihdp.unu.edu/article/read/vulnerability>
- Ivey, J., Smithers, J.S., de Loë, R.C. & Kreutzwiser, R.D. (2004). Community capacity for adaptation to climate-induced water shortages: linking institutional complexity and local actors. *Environmental Management*, 33(1): 36-47.
- Jabareen, Y.R. (2009). Building a conceptual framework: philosophy, definitions, and procedure. *International Journal of Qualitative Methods*, 8(4), 49-62.
- Jorgensen, B.S., & Stedman, R.C. (2001). Sense of place as an attitude: Lakeshore owners attitudes toward their properties. *Journal of Environmental Psychology*, 21, 233–248.
- Kaltenborn, B. (1998). Effects of sense of place on responses to environmental impacts: a study among residents in Svalbard in the Norwegian high Arctic. *Applied Geography*, 18, 169–189.
- Kelly, E. N., Short, J. W., Schindler, D. W., Hodson, P. V., Ma, M., Kwan, A. K. & Fortin, B. L. (2009). Oil sands development contributes polycyclic aromatic compounds to the Athabasca River and its tributaries. *Proceedings of the National Academy of Sciences*, 106(52), 22346-22351.
- Kelly, E. (2013). *Personal communication, May 23, 2013*. Yellowknife, NT.
- Kenny, C., Faries, E.J., Fiske, J.A. & Voyageur, C. (2004). *A holistic framework for Aboriginal policy research*. Ottawa: Status of Women Canada.
- Kerr, J.A. (1997). Future water levels and flows for Great Slave and Great Bear Lakes, Mackenzie River, and Mackenzie Delta. In Cohen, S.J. (Ed.), *Mackenzie Basin Impact Study: Final report* (pp. 73-91).
- Keskitalo, E.C.H. (2004). *Climate change and globalization in the Arctic: An integrated approach to vulnerability assessment*. London: Earthscan.
- King, F. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.
- King, P. (2010). *Personal communication – interview*. Fort Resolution, NT, Canada.
- King, S. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.
- King, T. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.

- Kitzinger, J. (1995). Qualitative Research: Introducing focus groups. *British Medical Journal*, 311(7000), 299-302.
- Kitzinger J. (1994a). The methodology of focus groups: the importance of interactions between research participants. *Sociology of Health and Illness*, 16, 103-21.
- Kitzinger, J. (1994b). Focus groups: Method or madness? In M. Boulton (Ed.), *Methodological advances on social research in HIV/AIDS* (pp. 159–175). London: Taylor & Francis.
- Klein, R.J.T., Huq, S., Denton, F., Downing, T.E., Richels, R.G., Robinson, J.B. & Toth, F.L. (2007) Inter-relationships between adaptation and mitigation. In M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, (eds), *Climate change 2007: Impacts, adaptation and vulnerability. Contribution of working group ii to the fourth assessment report of the intergovernmental panel on climate change* (pp. 745-777). Cambridge, UK: Cambridge University Press.
- Knez, I. (2005). Attachment and identity as related to a place and its perceived climate. *Journal of Environmental Psychology*, 25, 207–218.
- Kofinas, G. P. & Chapin, III, F.S. (2009). Sustaining livelihoods and human well-being during social–ecological change. In Folke, C., Kofinas, G. P., & Chapin, III, F. S. (eds.), *Principles of ecosystem stewardship* (pp.55-75). New York, NY: Springer New York.
- Korpela, K. M. (1989). Place-identity as a product of environmental self-regulation. *Journal of Environmental Psychology*, 9(3), 241-256.
- Korsmo, F.L. & Graham, A. (2002). Research in the North American north: action and reaction. *Arctic*, 55(4), 319–328.
- Krefting, L. (1991). Rigor in qualitative research: The assessment of trustworthiness. *The American Journal of Occupational Therapy*, 45(3), 214-222.
- Kuruppu, N. (2009). Adapting water resources to climate change in Kiribati: the importance of cultural values and meanings. *Environmental Science & Policy*, 12, 799-809.
- Kuruppu, N. & Liverman, D. (2011). Mental preparation for climate adaptation: The role of cognition and culture in enhancing adaptive capacity of water management in Kiribati. *Global Environmental Change*, 21(2), 657-669.
- Kyle, G., Graefe, A. & Manning, R. (2005). Testing the dimensionality of place attachment in recreational settings. *Environment and Behavior*, 37(2), 153-177.
- Lafferty, G. (2010). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Lafferty, R. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Laidler, G. J. et al (2009). Travelling and hunting in a changing Arctic: assessing Inuit vulnerability to sea ice change in Igloolik, Nunavut. *Climatic Change*, 94(3-4), 363-397.
- Lalli, M. (1992). Urban-related identity: Theory, measurement, and empirical findings. *Journal of Environmental Psychology*, 12(4), 285-303.
- Laroque, M. (2010). *Personal communication – photo essay*. Fort Resolution, NT, Canada.
- Legislative Assembly of the Northwest Territories. (n.d.). *Fort Resolution*. Retrieved April 8, 2009, from [http://www.assembly.gov.nt.ca/\\_live/pages/wpPages/mapfortresolution.aspx](http://www.assembly.gov.nt.ca/_live/pages/wpPages/mapfortresolution.aspx)
- Leach, M., Mearns, R. & Scoones, I. (1999). Environmental entitlements: dynamics and institutions in community-based natural resource management. *World Development*, 27(2), 225-247.
- Lewicka, M. (2008). Place attachment, place identity, and place memory: Restoring the forgotten city past. *Journal of Environmental Psychology*, 28(3), 209-231.

- Lorenzoni, I., Jordan, A., O'Riordan, T., Turner, K. & Hulme, M. (2000). Part II. A co-evolutionary approach to climate change impact assessment: A scenario-based study in the UK. *Global Environmental Change*, 10(2), 144-155.
- Lorenzoni, I. & Pidgeon, N.F. (2006). Public views on climate change: European and USA perspectives. *Climatic Change*, 77(1-2), 73-95.
- Low, S. & Altman I. (1992). Place attachment: a conceptual inquiry. In: Altman I. & Low S (eds), *Place Attachment* (pp.1-12). New York: Plenum; 1992.
- Ludwig D., Mangel M. & Haddad, B. (2001). Ecology, conservation, and public policy. *Annual Review of Ecological Systems*, 32, 481–517.
- Mandeville, A. (2010). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Mandeville, V. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Marshall, N.A., Marshall, P.A., Tamelander, J., Obura, D., Malleret-King, D. & Cinner, J. E. (2009). *A framework for social adaptation to climate change: sustaining tropical coastal communities and industries*. IUCN, Gland, Switzerland.
- Massey, D. (1997). A global sense of place. In: Barnes, T. & Gregory, D. (eds), *Reading Human Geography* (pp. 315-323). London: Arnold.
- Manzo, L.C. & Perkins, D.D. (2006). Finding common ground: The importance of place attachment to community participation and planning. *Journal of Planning Literature*, 20(4), 335-350.
- McAndrew, F.T. (1998). The measurement of 'rootedness' and the prediction of attachment to home-towns in college students. *Journal of Environmental Psychology*, 18(4), 409-417.
- McLeman, R. & Smit, B. (2006) Migration as an adaptation to climate change. *Climatic Change*, 76, 31–53.
- McKay, H. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.
- McKay, L. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.
- McKay, R. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Miersch, S. (2011). *Personal communication – photo essay*. Fort Resolution, NT, Canada.
- Mongeon, C. (2008). *Paleohydrologic reconstruction of three shallow basins, Slave River Delta, NWT, using stable isotope methods*. Unpublished master's thesis. Waterloo: Wilfrid Laurier University.
- MRBB. (2003). Chapter 6: Great Slave Sub-Basin. In *Mackenzie River Basin State of the Aquatic Ecosystem Report 2003*. NWT: MRBB.
- MRBB. (2012). *2012 issues report: Oil sands development, hydroelectric development, and climate change in the Mackenzie River Basin*. Yellowknife, NT: MRBB.
- Norn, L. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Northwest Territory Métis Nation. (2014). Northwest Territory Métis Nation Declaration. Accessed December 7, 2014, from <http://www.nwtmetisnation.ca/declaration.html>.
- Northwest Territory Métis Nation, Indian and Northern Affairs Canada, Government of the Northwest Territories. (n.d.). Northwest Territory Métis Nation Negotiations. Accessed December 7, 2014, from [http://www.daair.gov.nt.ca/\\_live/documents/content/NWTMN\\_negotiations.eng.pdf](http://www.daair.gov.nt.ca/_live/documents/content/NWTMN_negotiations.eng.pdf).
- O'Brien, K., & Hochachka, G. (2010). Integral adaptation to climate change. *Journal of Integral Theory & Practice*, 5(1), 89-102.
- O'Brien, K. L. & Leichenko, R. M. (2000). Double exposure: assessing the impacts of climate change within the context of economic globalization. *Global Environmental Change*, 10(3), 221-232.

- O'Brien, K.L. & Leichenko, R.M. (2003). Winners and losers in the context of global change. *Annals of the Association of American Geographers*, 93, 89–103.
- O'Brien, K. L., & Wolf, J. (2010). A values-based approach to vulnerability and adaptation to climate change. *Wiley Interdisciplinary Reviews: Climate Change*, 1, 232-242
- O'Brien, K., Eriksen, S., Schjolden, A. & Nygaard, L.P. (2004). *What's in a word? Conflicting interpretations of vulnerability in climate change research*. CICERO Working Paper 2004. Oslo: CICERO. Available at: <http://www.cicero.uio.no/media/2682.pdf> (Accessed September 7, 2011).
- Olmos, S. (2001). *Vulnerability and adaptation to climate change: Concepts, issues, assessment methods*. Climate Change Knowledge Network [online]. Accessed October 19, 2013. Available from [http://www.cckn.net/pdf/va\\_foundation\\_final.pdf](http://www.cckn.net/pdf/va_foundation_final.pdf).
- Olsson, P., Folke, C. & Berkes, F. (2004). Adaptive co-management for building resilience in social-ecological systems. *Environmental Management*, 34, 75–90.
- O'Riordan, T. & Jordan, A. (1999). Institutions, climate change and cultural theory: Towards a common analytical framework. *Global Environmental Change*, 9(2), 81-93.
- Paavola, J. & Adger, W.N. (2006). Fair adaptation to climate change. *Ecological Economics*, 56(4), 594-609.
- Parkins, J.R., Varghese, J. & Stedman, R.C. (2004). Identifying indicators of community sustainability in the Robson Valley, British Columbia. *British Columbia Journal of Ecosystems and Management*, 4(2), 1–19.
- Patterson, M.E. & Williams, D.R. (2005). Maintaining research traditions on place: Diversity of thought and scientific progress. *Journal of Environmental Psychology*, 25, 361-380.
- Patton, M.Q. (2003). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks: Sage Publications.
- Pelling, M., High, C., Dearing, J. & Smith, D. (2008). Shadow spaces for social learning: a relational understanding of adaptive capacity to climate change within organisations. *Environment and Planning A*, 40(4), 867-884.
- Pembina Institute (n.d.). *The waters that bind us: Fact Sheet*. Accessed October 14, 2013, from [http://www.google.ca/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=4&ved=0CDwQFjAD&url=http%3A%2F%2Fpubs.pembina.org%2Freports%2Fwatersthatbind-us.pdf&ei=B0JcUunXMMHwigLqq4HYDg&usg=AFQjCNEYRf0hTKkDu\\_r1t7kZIMY1pLPuAQ](http://www.google.ca/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=4&ved=0CDwQFjAD&url=http%3A%2F%2Fpubs.pembina.org%2Freports%2Fwatersthatbind-us.pdf&ei=B0JcUunXMMHwigLqq4HYDg&usg=AFQjCNEYRf0hTKkDu_r1t7kZIMY1pLPuAQ)
- Pierrot, M. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Phillips, D.C. (1995). The good, the bad, and the ugly: The many faces of constructivism. *Educational Researcher*, 24(7), 5-12.
- Plummer, R. & Armitage, D. (2010). Integrating perspectives on adaptive capacity and environmental governance. In D. Armitage & R. Plummer (eds), *Adaptive capacity and environmental governance*. Berlin: Springer.
- Plummer, R. & FitzGibbon, J.E. (2007). Connecting adaptive co-management, social learning and social capital through theory and practice. In Armitage, D., Berkes, F. & Doubleday, N. (eds), *Adaptive co-management: learning, collaboration and multi-level governance* (pp. 38-61). Vancouver, British Columbia: University of British Columbia Press.
- Polletta, F., & Jasper, J.M. (2001). Collective identity and social movements. *Annual Review of Sociology*, 283-305.
- Ponterotto, J.G. (2005). Qualitative research in counseling psychology: A primer on research paradigms and philosophy of science. *Journal of Counseling Psychology*, 52(2), 126.

- Pretty, G.H., Chipuer, H.M. & Bramston, P. (2003). Sense of place amongst adolescents and adults in two rural Australian towns: The discriminating features of place attachment, sense of community and place dependence in relation to place identity. *Journal of Environmental Psychology*, 23(3), 273-287.
- Prno, J., Bradshaw, B., Wandel, J., Pearce, T., Smit, B. & Tozer, L. (2011). Community vulnerability to climate change in the context of other exposure-sensitivities in Kugluktuk, Nunavut. *Polar Research*, 30(1).
- Proshansky, H.M. (1978). The city and self-identity. *Environment and Behavior*, 10(2), 147-169.
- Proshansky, H., Fabian, A. & Kaminoff, R. (1983). Place-identity: physical world socialization of the self. *Journal of Environmental Psychology*, 3, 57-83.
- Raymond, C.M., Fazey, I., Reed, M.S., Stringer, L.C., Robinson, G.M. & Evely, A. C. (2010). Integrating local and scientific knowledge for environmental management. *Journal of Environmental Management*, 91(8):1766-1777.
- Relph, E. (2008). Sense of place and emerging social and environmental challenges. In J. Eyles, A. Williams (eds.), *Sense of place, health and quality of life* (pp. 31-44). Aldershot: Ashgate.
- Relph, E. (1976). *Place and placelessness*. London: Pion.
- Resilience Alliance (2002). *Resilience* [online]. Accessed October 19, 2013. Available from <http://www.resalliance.org/index.php/resilience>
- Ribot, J.C., Najam, A. & Watson, G. (1996). Climate variation, vulnerability and sustainable development in the semi-arid tropics. In Ribot, J.C., Magalhaes, A.R. & Panagides, S.S. (eds.), *Climate Variability Climate Change and Social Vulnerability in the Semi-Arid Tropics* (pp. 1-10). Cambridge University Press, Cambridge,
- Robbins, P. (2004). *Political Ecology*. Malden, MA: Blackwell Publishing.
- Rogers, E. & Weber, E.P. (2010). Thinking harder about outcomes for collaborative governance arrangements. *The American Review of Public Administration* 40(5), 546-567.
- Rose, G. (1995). Place and identity: A sense of place. In Massey, B. & Jess, P. (eds), *A place in the world? Places, cultures and globalization* (pp. 88-132). Oxford: The Open University.
- Saldaña, J. (2012). *The coding manual for qualitative researchers*. Thousand Oaks: Sage.
- Sanderson, J., Czarnecki, A. & Faria, D. (2012). *Water and suspended sediment quality of the Transboundary reach of the Slave River, Northwest Territories*. Report prepared for AANDC. Yellowknife, NT: AANDC.
- Sarbin, T. (1983). Place identity as a component of self: An addendum. *Journal of Environmental Psychology*, 3, 337-342.
- Sayine, Mae. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Scheraga, J.D. & Grambsch, A.E. (1998). Risks, opportunities, and adaptation to climate change. *Climate Research*, 10, 85-95.
- Scheraga, J.D., Ebi, K.L., Furlow, J. & Moreno, A.R. (2003). From science to policy: developing responses to climate change. In In McMichael, A.J., Campbell-Lendrum, D., Corvalan, C.F., Ebi, K.L., Githeko, A., Scheraga, J.D. et al., eds), *Climate change and human health: Risks and responses* (pp. 237-266). Copenhagen: World Health Organization/World Meteorological Organization/United Nations Environment Programme.
- Sen, A. (1984). *Resources, Values and Development*. Oxford: Basil Blackwell.

- Sherk, E. (2006). *Concern in NWT over oil sands impact*. Northern News Services [online edition], December 4, 2006. Accessed October 14, 2013 from [http://www.nnsl.com/frames/newspapers/2006-12/dec4\\_06rv.html](http://www.nnsl.com/frames/newspapers/2006-12/dec4_06rv.html)
- Silverstein, S. (1974). *Where the Sidewalk Ends*. Harper Collins Children's Books, New York, New York.
- Sibley, D. (1995). *Geographies of Exclusion*. London: Routledge.
- Simon, P. (2010). *Personal communication – photo essay*. Fort Resolution, NT, Canada.
- Simon, R. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Smit, B., Hovelrsud, G. & Wandel, J. (2008). *CAVIAR: Community adaptation and vulnerability in arctic regions*. University of Guelph, Department of Geography, Occasional Paper No. 28.
- Smit, B., Hovelrsud, G.K., Wandel, J. & Andrachuk, M. (2010). Introduction to the CAVIAR project and framework. In Hovelrsud, G.K. & Smit, B. (eds), *Community adaptation and vulnerability in arctic regions* (pp. 1-22). Dordrecht: Springer.
- Smit, B., Pilifosova, O., Burton, I., Challenger, B., Huq, S., Klein, R. & Yohe, G. (2001). *Adaptation to Climate Change in the Context of Sustainable Development and Equity*. IPCC Third Assessment Report, Working Group II.
- Smit, B., & Wandel, J. (2006). Adaptation, adaptive capacity and vulnerability. *Global Environmental Change*, 16(3), 282-292.
- Smith, P. (2010). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Smithers, J., & Smit, B. (1997). Human adaptation to climatic variability and change. *Global Environmental Change*, 7(2), 129-146.
- Stake, R.E. (1995). *The art of case study research*. Thousand Oaks, CA: Sage Publications.
- Stake, R.E. (2003). *Case studies*. In N. K. Denzin & Y. S. Lincoln (eds). *Handbook of qualitative research* (pp. 134-164) (2nd ed.). Thousand Oaks, CA: Sage.
- Statistics Canada. (2012). *Fort Resolution, Northwest Territories (Code 6105018) and Northwest Territories (Code 61) (table). Census Profile. 2011 Census*. Statistics Canada Catalogue no. 98-316-XWE. Ottawa. Released October 24, 2012. <http://www12.statcan.gc.ca/census-recensement/2011/dp-pd/prof/index.cfm?Lang=E> (accessed May 19, 2014).
- Stedman, R.C. (2002). Toward a social psychology of place: Predicting behavior from place based cognitions, attitude, and identity. *Environment and Behavior*, 34(5), 405–425.
- Stedman, R.C. (2003). Is it really just social construction? The contribution of the physical environment to sense of place. *Society & Natural Resources*, 16(8), 671-686.
- Steele, F. (1981). *The Sense of Place*. Boston: CBI Pub. Co.
- Stevenson, M.G. (1996). Indigenous knowledge in environmental assessment. *Arctic*, 49(3), 278-291.
- Steward, J. (1955). *Theory of Culture Change*. Urbana: University of Illinois Press.
- Strack, R., Magill, C., & McDonagh, K. (2004). Engaging youth through Photovoice. *Health Promotion Practice*, 5(1): 49-58.
- Sutton, M.Q. & Anderson, E.N. (2009). *Introduction to cultural ecology*. Lanham: Rowman Altamira.
- Swain, J. (2006). An Ethnographic Approach to Researching Children in Junior School. *International Journal of Social Research Methodology*, 9(3), 199.
- Swanson, D., Hiley, J., Venema, H.D. & Grosshans, R. (2007). *Indicators of adaptive capacity to Cclimate change for agriculture in the Prairie region of Canada: An analysis based on*



- Statistics Canada's Census of Agriculture*. Working Paper for the Prairie Climate Resilience Project. Winnipeg: International Institute for Sustainable Development.
- Taylor, B., de Loe, R. & Bjornlund, H. (2012). Evaluating knowledge production in collaborative water governance. *Water Alternatives*, 6(1), 42-66.
- Timoney, K. (2002). A dying delta? A case study of the wetland paradigm. *Wetlands*, 22(2), 282-300.
- Timoney, K.P. (2007). *A study of water and sediment quality as related to public health issues, Fort Chipewyan, Alberta*. Report prepared for the Nunee Health Board Survey, Fort Chipewyan, Alberta. Sherwood Park, AB: Treeline Ecological Research.
- Tompkins, E.L. & Adger, W.N. (2004). Does adaptive management of natural resources enhance resilience to climate change? *Ecology and Society*, 9(2).
- Tuan, Y.F. (1974). *Topophilia: A study of environmental perception, attitudes, and values*. Englewood Cliffs, NJ: Prentice-Hall.
- Tuan, Y.F. (1977). *Space and Place: The Perspective of Experience*. Minneapolis: University of Minnesota Press.
- Tuan, Y.F. (1980) Rootedness versus Sense of Place. *Landscape*, 24, 3-8
- Turner, N.J., Gregory, R., Brooks, C., Failing, L. & Satterfield, T. (2008). From invisibility to transparency: identifying the implications. *Ecology and Society*, 13(2), 7.
- Twigger-Ross, C.L., & Uzzell, D.L. (1996). Place and identity processes. *Journal of environmental psychology*, 16(3), 205-220.
- Twigger-Ross, C., Bonaiuto, M. & Breakwell, G. (2003). Identity theories and environmental psychology. In: M. Bonnes, T. Lee, & M. Bonaiuto (eds), *Psychological Theories for Environmental Issues* (pp. 203-243). Aldershot: Ashgate.
- Unka, D. (2011). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Unka, M. (2011). *Personal communication – photo essay*. Fort Resolution, NT, Canada.
- Unka, T. (2010). *Personal communication – interview*. Fort Resolution, NT, Canada.
- Usher, P.J. (2000). Traditional ecological knowledge in environmental assessment and management. *Arctic*, 53(2) 183-193.
- Vatn, A. (2005). *Institutions and the environment*. Cheltenham, UK: Edward Elgar Publishing Limited.
- Vincent, K. (2007). Uncertainty in adaptive capacity and the importance of scale. *Global Environmental Change*, 17(1), 12-24.
- Wall, E., & Marzall, K. (2006). Adaptive capacity for climate change in Canadian rural Communities. *Local Environment*, 11(4), 373-397.
- Walker, B. & Salt, D. (2006). *Resilience thinking: sustaining ecosystems and people in a changing world*. Washington: Island Press.
- Wang, C. & Burris, M. (1997). Photovoice: concept, methodology, and use for participatory needs assessment, *Health Education & Behavior*, 24(3), 369–387.
- Watts, M. J., & Bohle, H. G. (1993). The space of vulnerability: the causal structure of hunger and famine. *Progress in Human Geography*, 17, 43–67.
- Wesche, S.D. (2009). *Responding to change in a Northern Aboriginal community (Fort Resolution, NWT, Canada): Linking social and ecological perspectives*. Unpublished PhD Thesis. Wilfrid Laurier University.
- Wesche, S. & Armitage, D.R. (2010). From the inside out: A multi-scale analysis of adaptive capacity in a northern community and the governance implications. In D. R. Armitage &

- R. Plummer (eds.), *Adaptive capacity and environmental governance* (pp.107-132). Heidelberg: Springer.
- Wesche, S. & Armitage, D.R. (2011). 'As long as the sun shines, the rivers flow and grass grows': Vulnerability, adaptation and environmental change in Deninu Kue Traditional Territory, Northwest Territories. In B. Smit & G. Hovelsrud (eds). *Community adaptation and vulnerability in arctic regions* (pp. 163-190). Heidelberg: Springer
- Wester-Herber, M. (2004). Underlying concerns in land-use conflicts—the role of place-identity in risk perception. *Environmental Science & Policy*, 7(2), 109-116.
- White, D.D., Virden, R.J. & van Riper, C.J. (2008). Effects of place identity, place dependence, and experience-use history on perceptions and recreation impacts in a natural setting. *Environmental Management*, 42(4), 647-657.
- Williams, D.R. & Vaske, J.J. (2003). The measurement of place attachment: Validity and generalizability of a psychometric approach. *Forest Science*, 49(6), 830-840.
- Williams, D.R., Patterson, M.E., Roggenbuck, J.W. & Watson, A.E. (1992). Beyond the commodity metaphor: Examining emotional and symbolic attachment to place. *Leisure Sciences*, 14, 29-46.
- Willis, J.W. (2007). *Foundations of qualitative research: interpretive and critical approaches*. Thousand Oaks: Sage.
- Wilson, K. (2003). Therapeutic landscapes and First Nations peoples: An exploration of culture, health and place. *Health & Place*, 9(2), 83-90.
- Windsor, J.E., & McVey, J.A. (2005). Annihilation of both place and sense of place: the experience of the Cheslatta T'En Canadian First Nation within the context of large-scale environmental projects. *The Geographical Journal*, 171(2), 146-165.
- Wolf, J., Alice, I. & Bell, T. (2013). Values, climate change, and implications for adaptation: Evidence from two communities in Labrador, Canada. *Global Environmental Change*, 23(2), 548-562.
- Wolf, J., & Moser, S. C. (2011). Individual understandings, perceptions, and engagement with climate change: insights from in-depth studies across the world. *Wiley Interdisciplinary Reviews: Climate Change*, 2(4), 547-569.
- Wolfe, B.B., Armitage, D., Wesche, S., Brock, B.E., Sokal, M.A, Clogg-Wright, K.P., Mongeon, C.L., Adam, M.E., Hall, R.I. & Edwards, T.W.D. (2007). From isotopes to TK interviews: Towards interdisciplinary research in Fort Resolution and the Slave River Delta, NWT. *Arctic*, 60, 75–87.
- Wolfe, B. Hall, R. & Elmes, M. (2012). *Research progress report – November 25, 2012: Sediment core sampling to assess contaminant deposition to the Slave River Delta over time*. Unpublished research progress report. Waterloo: ON: Wilfrid Laurier University.
- Yin, R.K. (2003). *Case study research: Design and methods* (3rd ed.). Thousand Oaks, CA: Sage Publications.
- Yohe, G. & Tol, R.S.J. (2002). Indicators for social and economic coping capacity: moving toward a working definition of adaptive capacity. *Global Environmental Change*, 12, 25-40.