ARCTIC
VOL. 65, NO. 4 (DECEMBER 2012) P. 439–455

Weathering Changes: Cultivating Local and Traditional Knowledge of Environmental Change in Tr'ondëk Hwëch'in Traditional Territory

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(*Received 26 January 2011; accepted in revised form 11 February 2012*)

ABSTRACT. This paper explores a particular experience of cultural bridging between the Heritage Department of the Tr'ondëk Hwëch'in (TH) First Nation and academics and government funders taking part in the 2007–09 International Polar Year. The TH Heritage Department acted as lead researcher on the project entitled *Documenting Traditional Knowledge in Relation to Climate Change*. TH Heritage staff spearheaded and largely carried out the project work. Academic researchers, acting as contractors, collaborated in some project activities and produced academic papers summarizing the work. This collaboration provided a rare opportunity for the TH Heritage Department to share the research it has conducted for more than a decade in the broader, institutional context of university and government research. Its success highlights the fact that relationships between these partners are evolving and becoming more equitable: First Nations research is receiving more support, and the corpus of mainstream knowledge is changing, allowing different bodies of work to "count" as knowledge. This paper analyzes some of the differences between TH Heritage approaches to its mandate for gathering and sharing Traditional Knowledge (TK) and the understandings and uses of TK by other governments and by university-based academics. On the basis of project results and recent policy developments in northern governance and research, it makes practical recommendations for reconciling knowledge approaches and building mutually supportive research relationships between First Nations, academics, and government.

Key words: Tr'ondëk Hwëch'in, traditional knowledge, climate change, Yukon Territory, indigenous knowledge, oral tradition, research methodology, social sciences, fieldwork

RÉSUMÉ. Le présent article porte sur une expérience particulière relativement à l'établissement de liens entre le département du patrimoine de la Première Nation des Tr'ondëk Hwëch'in (TH) et certains universitaires et bailleurs de fonds gouvernementaux qui ont participé à l'Année polaire internationale de 2007-2009. Le département du patrimoine de la Première Nation des TH a servi de chercheur principal dans le cadre du projet intitulé *Documenting Traditional Knowledge in Relation to Climate Change*. Le personnel du département du patrimoine a dirigé et effectué une grande partie du projet. Pour leur part, les chercheurs universitaires ont collaboré au projet à titre d'entrepreneurs à contrat, après quoi ils ont produit des articles pour résumer leur travail. Cette collaboration a procuré une rare occasion au département du patrimoine de la Première Nation des TH de faire part du fruit des recherches réalisées pendant plus d'une dizaine d'années dans le contexte institutionnel plus vaste de la recherche universitaire et gouvernementale. Le succès remporté par les recherches fait ressortir le fait que les relations entre ces partenaires évoluent et deviennent plus équitables. Ainsi, les recherches effectuées par les Premières nations reçoivent une plus grande reconnaissance, tandis que le corpus de connaissances grand public est en train de changer en ce sens qu'il permet à différents ensembles de connaissances de « compter » au nombre des connaissances. Cet article analyse certaines des différences qui existent entre la méthode adoptée par le département du patrimoine de la Première nation des TH en ce qui a trait à son mandat visant à recueillir et à partager les connaissances traditionnelles (CT) et les entendements et utilisations des connaissances traditionnelles par d'autres gouvernements et par les universitaires. À la lumière des résultats du projet et des récents développements sur le plan des politiques en matière de gouvernance et de recherche dans le Nord, l'article présente des recommandations pratiques en vue de la réconciliation des méthodes de recueil des connaissances et de l'établissement de relations de soutien mutuel entre les Premières Nations, les universitaires et les gouvernements.

Mots clés : Tr'ondëk Hwëch'in, connaissances traditionnelles, changement climatique, territoire du Yukon, connaissances indigènes, tradition orale, méthodologie de recherche, sciences sociales, travail sur le terrain

Traduit pour la revue *Arctic* par Nicole Giguère.

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INTRODUCTION

In response to input from northern and Aboriginal communities, the Canadian government opened its call for 2007–09 International Polar Year (IPY) proposals to researchers outside university and federal or territorial government programs. The Tr'ondëk Hwëch'in (TH) First Nation was one of two Yukon First Nations to receive grants. As principal investigator on a climate change and traditional knowledge project within TH traditional territory, the TH Heritage Department applied a unique approach to gather, share, and strengthen the traditional knowledge of its citizens and to facilitate community conversations about the environmental changes that the TH government and other levels of government will have to address.

The project was a new type of collaboration, both for the TH government and for the IPY in Canada. The need for community-based and community-led northern research is becoming widely recognized, as is the need for governments to take traditional knowledge into account in their decision making (Governments of Yukon, NWT, and Nunavut, 2007; Northern Governance Policy Research Conference, 2009). To meet these needs and successfully bridge the differences between institutional and community approaches requires new research models and research relationships (Fienup-Riordan, 1999; Wolfe et al., 2007). In recent decades, scientists and social scientists working in northern indigenous communities have increasingly evolved research practices to incorporate community consultation and community collaboration and to recognize the importance of traditional knowledge (Cruikshank, 1998; Berkes et al., 2001). Northern governments and funding agencies have adopted policies to enhance community input into northern research (Gearheard and Shirley, 2007). Research efforts based in northern communities and led by such communities and their governments have also increasingly been supported. However, the inclusion of northern-led research projects, networks, and non-academic institutions is not part of science and social science research traditions: academic research practices and paradigms are still adapting to these nontraditional partners. As part of its contribution to the IPY, the TH Heritage Department reflected on its research partnership. Here we examine what made the research process successful, what areas could improve, and how other traditional knowledge research projects initiated and led by northern communities could be better supported in the future.

We discuss the contexts and qualities of traditional knowledge as they pertain to the research methods the TH Heritage Department evolved over the last decade and applied to the IPY project. Our hope is to improve the mutual understanding between Tr'ondëk Hwëch'in traditional knowledge researchers and their academic and government counterparts. In particular, through a processual orientation that describes the incorporation of TK throughout TH Heritage programs and practices, we provide a glimpse of the institutional role played by the present-day TH government, in supporting the lived practice of Tr'ondëk Hwëch'in traditional knowledge. Finally, the paper offers further practical recommendations for building better partnerships to support this type of research.

CONTEXTS OF THE RESEARCH

Tr'ondëk Hwëch'in Government

The present day Tr'ondëk Hwëch'in, or People of the River, are descendents of Hän speaking people whose traditional territory extended out from the Yukon River and its confluence with the Klondike River (Fig. 1). Tr'ondëk Hwëch'in people are related to other Hän communities along the Yukon River into Alaska, and to Gwich'in and Northern Tutchone people (Dobrowolsky, 2003; Midnight Arts, 2003). Under final and self-government agreements signed in 1998 (Government of Canada, 1998a, b), province-like responsibilities in such areas as health, education, social services, and natural resources management devolved to the Tr'ondëk Hwëch'in government. The TH government represents approximately 1000 citizens, exercises governance over approximately 2600 km^2 of settlement lands, and ensures the exercise of certain rights, such as hunting rights, over a much larger 64 000 km^2 traditional territory (Midnight Arts, 2003; Tr'ondëk Hwëch'in Government, 2009a). The main offices of the TH government are located in Dawson City, a gold rush town founded in 1896, which has approximately 1800 permanent residents (Government of Canada, 2009).

Self-government resulted in greatly extended powers compared to those of the previous Indian Band Council, but without a concomitant increase in funding for governance. As core funding is scarce, a substantial percentage of government revenues must be obtained through applications to fund specific projects or programs. Thus the revenue stream is substantially less stable than that of other governments. This instability has implications for long-term planning, for program and service delivery, for cash flow, for management of land and resources, and for government autonomy in developing priorities. Traditional knowledge research is especially affected. By law, TK must be incorporated into decision making at many levels, for example, in the deliberations for projects under the Yukon Environmental and Social Assessment Act. It is a responsibility of the TH government to ensure that appropriately applied, best quality information is available and used, and TK information is also integral to the government's everyday operation. The research portion of this mandate—the gathering of relevant and appropriate information on the occupation, use, and stewardship of traditional lands as intertwined with the lives of the people—is especially pressing. The time window to work with a generation that includes some of the last elders to have lived on the land without the disruption of attending residential school is disappearing. In the last 15

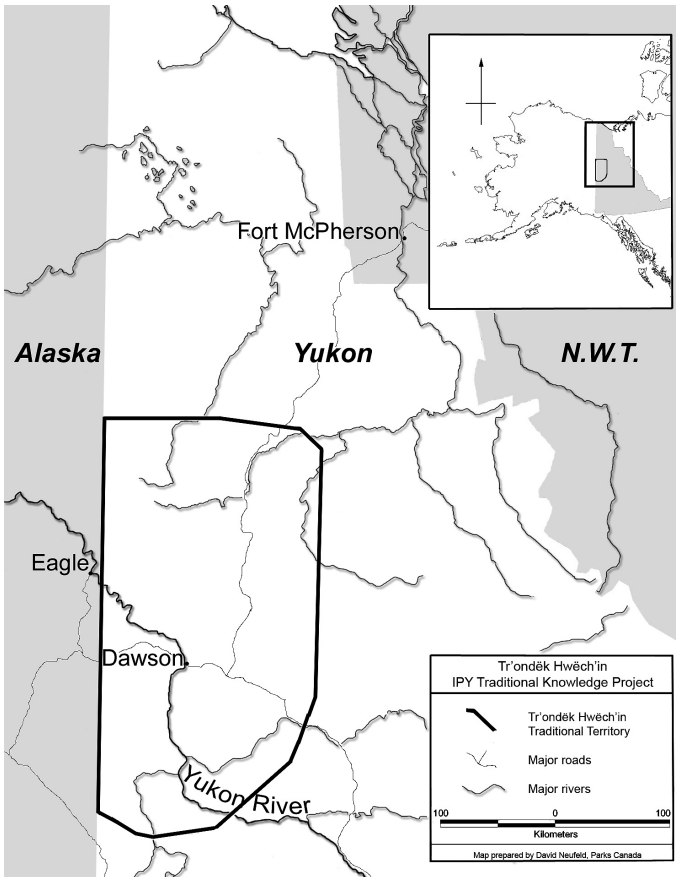

FIG. 1. Tr'ondëk Hwëch'in traditional territory.

years, the TH government has enhanced its research capacity through cross-cultural projects with other governments, academics, and non-profit organizations. These efforts have included two major river symposia in 1995 and 2000, in which TH elders and citizens participated alongside scientists, social scientists, and policy specialists; the Myth and Medium workshop series, which focused on heritage conservation and programming; and ongoing smaller collaborations with academic and government researchers, and particularly with graduate students (Neufeld and Parsons, 2011).

The TH government prioritizes the funding of traditional knowledge research through its support of the Heritage Department, but resources are more bounded than the work to be done. Provisions mandating the use of TK are part of the Final Agreement. However, the Financial Transfer Agreement between the federal and TH governments is framed primarily in terms of program and service delivery, with little dedicated funding for crucial aspects of implementation such as TK research. Traditional knowledge is not a recognized program area in federal government terms, although it is a necessary research phase in the delivery of programs. To support the breadth of TK research required by the TH government's vision of responsible government, the Heritage Department is obliged to seek further funding arrangements, including research partnerships.

Governance and Climate Change

In 2004, the Arctic Climate Impact Assessment (ACIA), a joint project of the Arctic Council and the International Arctic Science Committee, made it clear that the effects of climate change on Arctic regions are dramatic. Temperature increases have been and will continue to be greater in the Yukon and western Arctic regions than almost anywhere else in the world, and these changes are predicted to have significant impacts on land, water, flora and fauna, infrastructure, accessibility of resources, and the ability of indigenous peoples to engage in hunting, gathering, trapping, fishing, and other livelihood activities (ACIA, 2004).

Territorial and federal governments are beginning to invest heavily in climate change adaptation and mitigation, but significant gaps remain. Federation of Canadian Municipalities research (Coates and Poelzer, 2010) highlights a lack of tools and planning to address hundreds of millions of dollars worth of municipal infrastructure reinforcement and replacement necessitated by melting permafrost and other climate change impacts. Research by indigenous organizations, including the Arctic Athabaskan Council and the Council of Yukon First Nations, points to changes that are taking place out on the land that affect everything from travel to the ability to collect, process, and store traditional foods (INAC, 2007; AAC, 2009). Although some local modeling and adaptation planning is taking place in the Dawson region—for example, TH citizens participated in the Northern Climate Exchange's development of a Dawson Community Climate Change Adaptation Plan—such planning is largely focused in and around Dawson City and cannot adequately address climate change threats to TH heritage sites, traditional trails, and access to traditional foods. It is therefore a TH government priority to collect and analyze information on environmental changes in the entire TH traditional territory. Such information is vital for long-range planning not only within the Heritage Department, but also in other government departments that have responsibilities related to lands and resources, infrastructure maintenance, and health. The need to address these knowledge gaps gave impetus to the *Documenting Traditional Knowledge in Relation to Climate Change and its Effects in Tr'ondëk Hwëch'in Traditional Territory* project.

TH Heritage Department's Approach to TK

The Tr'ondëk Hwëch'in Heritage Department has existed in some version of its present form since the very early days of the TH government. Guided by the chief and council and the TH government's Elders' Council and Youth Council, it works in consultation with other government departments and with TH citizens to manage, protect, and present TH cultural resources. It is a robust department, with several staff members and many programs. Work includes land-based research, seasonal archaeology projects, documentation of oral histories, storage of heritage material, development of significant heritage sites, Hän

language documentation and programming, and operation of the Dänojà Zho Cultural Centre. Additionally, the department supports a cycle of yearly on-the-land cultural programs, such as First Hunt and First Fish, and it shares information with and involves the TH community through the *Kentra Tay* newsletter, a monthly heritage publication, and through other community activities as appropriate. In 2004, the department won the Robert Kelly Memorial Award from the National Council on Public History for its integrated program of public involvement in heritage activities, research into community history, active support for artistic and cultural expression, and for language preservation activities spanning more than 35 years. In 2007, the Canadian Archaeology Association presented Tr'ondëk Hwëch'in and the Government of Yukon with the Public Communications Award in recognition of their outstanding joint work on the publication "Archaeology at Forty Mile/ Ch'ëdä Dëk."

Behind the development of this programming is a particular philosophy of heritage preservation and animation. The Heritage Department articulated a version of this philosophy at its "Myth and Medium" presentation in Ottawa in 2007 (Parsons et al., 2007), which drew on learnings from multiple years of Myth and Medium workshops and programming. In Tr'ondëk Hwëch'in culture, objects are valued for the skills and stories of which they are a part. Caring for artifacts involves a careful balance between applying technologies of preservation to extend an object's life and ensuring access to and use of an artifact in order to support the TH living culture. An example of this approach was a 2004 workshop in snowshoe making hosted by the Dänojà Zho Cultural Centre. The most valuable pair of snowshoes in the collection was passed around and used as a model by snowshoe makers. Keeping alive the "myth" that the snowshoes represented, which includes everything from stories and songs to the highly technical information required to make snowshoes appropriate to winter conditions, ensures the survival of a TH living culture in which snowshoes will be made and used. Another example of this approach is the "Bright and Beautiful" beadwork exhibition, hosted at Dänojà Zho from May to September 2009. The exhibition programming focused on the ongoing practice of beading in the community and on honouring women beaders who have produced creations of both practical and ceremonial value. The works and stories of current community artisans, as well as artisans from the past, were celebrated in the displays. Activities such as beading circles aimed to support novice beaders, as well as those with many years of experience. The exhibit increased exposure of beaders and their work, which in turn supported artisans in their ability to sell their creations at the Yukon Riverside Arts Festival and other local venues. The Dänojà Zho Cultural Centre gift shop showcases and markets the largest collection of handcrafted slippers in the Yukon, contributing to the economic viability of TH beading.

This holistic approach to supporting TH culture is also applied to the integration of traditional knowledge. Tr'ondëk Hwëch'in traditional knowledge exists by and through the people and their relationships (Tr'ondëk Hwëch'in Govrnment, 2009b). The department invests great care in creating ongoing relationships and supporting citizens in their lives and the practice of their culture. With youth, this care may take the form of opportunities to participate in land-based activities, cultural and language education in school, and mentoring and work experiences. With community elders, relationships exist within the more formal structure of the Elders' Council, but also through investment in relationships of care that extend support and respect to elders. For example, staff members ensure that elders receive meat from "First Hunt" (an annual seasonal program for high school aged youth) and may check in with and assist an elder who needs a driver or some other help to access a government service. In both the larger TH government offices and the Heritage Department, elders are welcomed with tea, coffee, and food whenever they drop in. The Heritage Department is flexible and sensitive in shifting its activities as community circumstances demand, for example, shortening or shifting an on-the-land activity depending on weather.

On the surface, it may not be immediately apparent how such TH Heritage staff practices as offering tea to an elder are different from standard academic research protocols within a northern community. However, TH Heritage is part of a working government. Just like Canadian Heritage, the department has schedules, job descriptions, and specific responsibilities to attend to in the area of cultural heritage. Yet it gives priority to being available to elders and other community members almost whenever the office is open, even if this requires shuffling around other duties, meetings, and exigencies of office work. This practice distinguishes TH governance from what TH citizens may experience elsewhere: except in service-delivery and community consultation or research contexts, citizen access to and involvement in other governments and academia is generally limited and structured by bureaucratic forms such as appointments, reports, and workshops on specific topics. Within the TH Heritage Department, traditional protocols such as respecting and attending to elders are not restricted to a domain of traditional knowledge research, but are a core of everyday governance. Just as TH TK exists by and through the people, the Heritage Department works towards a model of government in which TK exists by and through the people's governance.

While the department's primary focus is TH citizens, many activities are public or may involve other local people. For example, as part of living well with its neighbours and creating a shared understanding, the department frequently opens on-the-land camps to all interested local youth. First Hunt activities, ongoing for more than 20 years, have educated a generation of First Nations and non-First Nations hunters, contributing to a greater respect for TH values throughout the local community and more harmonious relationships between TH hunters and other hunters and local conservation officials.

THE RESEARCH PROJECT

From 2007 to 2010, the Tr'ondëk Hwëch'in Heritage Department acted as principal investigator on a climate change and traditional knowledge project based in TH territory. Developed through a process that included consultation with the Elders' Council, with youth, and with the rest of the TH government, the project aimed to gather traditional knowledge of current and past environmental change on TH traditional territory. Activities included more than 40 oral history interviews conducted and transcribed by TH staff and community members; two community mapping workshops; local presentations and local media activities on environmental change in the area; climate change educational activities integrated into cultural camps, regular heritage activities, and school curriculum; project visits to the communities of Fort McPherson and Eagle; on-the-land collection of GPS and photographic data; and the development of traditional knowledge collection kits. These kits were used by local youth, aged 10 to 17, to interview their elders about environmental change. A monograph available from the Heritage Department (TH Heritage Department and Friendship, 2011) provides breakdowns of project participants and staff, as well as a detailed description of the individual project activities. While the majority of interviewees were of First Nations descent, other members of the local community with long-term experience on the land, such as certain trappers, were also asked to take part in the project. Educational activities, including both school and land-based programs such as First Hunt, involved or were open to all youth in the community.

An academic team led by Parks Canada historian David Neufeld, a longtime collaborator with the TH Heritage Department, was assembled to lead the creation of a community mapping session report and other publications to communicate project results. Team members, all of whom had various levels of experience living and working among Yukon First Nations, lived outside the community during the project. However, they visited and spent time in the community throughout the project phases. A password-protected wiki was set up to facilitate communication and to share proprietary information relevant to the project. In addition to the mapping session report (E. Neufeld, 2011), the team produced two academic papers and a monograph. A paper by D. Neufeld (2011) draws on his experiences with Athabaskan and Western knowledge systems to tell a story about mapping and what he learned from brothers Victor and Percy Henry about navigating a particularly tricky stretch of the Yukon River, while the present paper examines the TH Heritage Department's approach to traditional knowledge in a wider context. The monograph (TH Heritage Department and Friendship, 2011) summarizes information gleaned from project activities on environmental changes that citizens are experiencing on Tr'ondëk Hwëch'in traditional territory, on how these changes are affecting Tr'ondëk Hwëch'in citizens, and on community development of adaptation strategies.

The academic papers emerging from the project are but one of several important products of the research process. The transcribed interviews, archived at the Heritage Department office, will be an asset to the community for decades to come. They are valuable not only for what they reveal about environmental change, but also for information about cultural sites and practices and for understanding what Northerners value and how TH citizens perceive climate change. This information is extremely helpful for researchers and educators planning for further climate change adaptation and mitigation. Two further climate change research projects that build on the information collected by the traditional knowledge project are already underway: a Yukon River traditional foods and health project, funded by Health Canada, and an assessment of vulnerabilities and risks associated with climate change done in partnership with the Council of Yukon First Nations.

Equally importantly, project activities strengthened traditional knowledge in its lived practice. For example, trips to Eagle and Fort McPherson reaffirmed family and community ties. The advent of international and territorial borders, the settlement of Hän people into permanent communities, and the reorganizing of main regional transportation along roads rather than along rivers and traditional trail routes acted to diminish travel and exchange between these communities (Dobrowsky, 2003) and weaken historical patterns of connection. The research visits were part of a series of initiatives in recent years to restore ties. The Spring Gathering, held to report results back to project participants, was also a time for people from participant communities to get together on the land to share stories and skills and practice traditional activities, such as scraping and preparing caribou hides. An example of a longer-term initiative growing out of the project is the Environmental Observation Calendar distribution and collection. The 16-month calendars, which are illustrated with colour photos of community members out on the land, include Hän language terms and places to write down plant, weather, and fish and wildlife observations. Given as a gesture of appreciation to all project participants, the calendars will be gathered again at the end of the seasonal cycle so that the TH Heritage Department can record the completed environmental observations. These collective seasonal observations will then be shared with other TH government departments and the broader community via the Heritage Department's newsletter.

CONTEXTS OF TRADITIONAL KNOWLEDGE: SHAPING RESEARCH TO SUIT TK

Nadasdy (2003:185) notes that TK researchers are often preoccupied with the technical and methodological obstacles to integrating TK and scientific knowledge. He points out that this preoccupation has "obscured the power relations that underlie the whole process of knowledge-integration.... [so that] the practice of knowledge-integration and co-management ends up taking for granted existing

Aboriginal-state relations and perpetuating, rather than transforming, unequal power relations."

A significant issue for the TH government in developing fruitful research partnerships has been the ability of non-First Nations institutions, such as governments and universities, to recognize the competencies of a First Nation to undertake traditional knowledge research. Effective partnerships require parties to understand, trust, and benefit from each other's skills and strengths. To work more harmoniously with TK and give it appropriate weight in decision making, universities and governments must shift their thinking and practice to better accommodate this form of knowledge (Huntington, 2000; Gearheard and Jamal, 2007; Wolfe et al., 2007). We hope that clarifying how the TH government works with traditional knowledge will lead to stronger partnerships by encouraging greater understanding of and appreciation for First Nations expertise in this area.

The comments below emerge from the TH government's perspective that the proper home and repository for its TK lies within its traditional territory and governance. The TH government is working to ensure the integrity of its traditional knowledge by organizing all relevant documentation and making it available within TH traditional territory, according to TH government protocols. Much as First Nations have moved from sometimes being unaware that important cultural and ceremonial objects were in collections around the world to finding and re-establishing connections with these objects and sometimes repatriating them to their communities of origin, so too it is important for TH citizens to be aware of and have access to research on TH knowledge and culture and to have this knowledge connected to its communities of origin. Chapter 3 of the Arctic Climate Impact Assessment further underlines how, in relation to climate change adaptation, traditional knowledge is first and foremost of importance for the Aboriginal communities of the circumpolar North in which this knowledge was developed (ACIA, 2004).

Embedded and Distributed Knowledge: A Context of Inseparability

Several researchers and project participants emphasized that traditional knowledge was knowledge for and with the people. Information about environmental change was really information about how environmental change has been affecting the people and what these effects imply for culture and life. In a larger sense, in one of the working definitions contained within the TH government's draft TK policy, the traditional knowledge of Tr'ondëk Hwëch'in people is simply "who we are" (Tr'ondëk Hwëch'in Government, 2009b). Phrased in the rights language of Western culture, traditional knowledge is closely linked to the inherent rights fundamental to the identity of the Tr'ondëk Hwëch'in people and integral to the cultural, political, economic, and social distinctiveness of the Tr'ondëk Hwëch'in (Tr'ondëk Hwëch'in Government, 2009b).

Within the research partnership, the TH government began from a basic assumption of this inseparability. As the representative government of TH citizens, it is the most appropriate body to coordinate traditional knowledge research, to act as a caretaker of such knowledge, to support the part of TK in responsible stewardship and governance within the TH traditional territory, and to conduct pertinent research with its citizens. Part of the "method" of the Heritage Department is to be, like TK itself, "emplaced" or embedded in an appropriate context of relationships with the land and people so that this knowledge can live. The Heritage Department is one important node in a distributed system of knowledge holders—made up of families and individuals—where knowledge becomes stronger as the web of relationships and knowledge practitioners widens.

This approach contrasts with the tendency of Western intellectual heritage, both in governments (Kulchyski, 2005) and in academia, to locate knowledge in texts. Mildon (2008) in his genealogy of Canadian court cases involving Aboriginal oral history knowledge, Irlbacher-Fox (2009) in her exploration of northern self-government negotiations, and Nadasdy (2003) in his analysis of the workings of co-management boards, demonstrate that within government and academic institutions in Canada today the knowledge that predominates is that which is written down. As economic historian Harold Innis (1950) has pointed out, societies that favour written over emplaced knowledge tend to build transportation and communication infrastructures that centralize information and encourage a center-periphery form of governmentality—a dynamic that has contributed to making rural Yukon First Nations a "margin" within Canada (Valaskakis, 1981; Cruikshank, 2005). Tensions between center and periphery, or outside and community forces, continue to shape the dynamic between Yukon First Nations and other levels of government, and many academics have similar dynamics at play in northern traditional knowledge research projects (Gearheard and Jamal, 2007; Wolfe et al., 2007; Pearce et al., 2009). The friction between hierarchy and autonomy of local knowledge can be lessened if partner agencies adopt more distributed knowledge and decision-making structures. These need not be completely decentralized; for example, many northern community colleges follow a hub-and-spoke model, with satellite campuses in smaller communities. Northern research associations, such as the Association of Canadian Universities for Northern Studies (ACUNS), have helped drive shifts towards more autonomous or decentered forms of knowledge organization (ACUNS, 2003). In recent decades, as northern Aboriginal peoples have gained more autonomy within Canada, concomitant institutional shifts in the internal organizations of other levels of government have smoothed the way to better relations. For example, Environment Yukon has been gradually shifting from a focus on species biologists towards regional biologist positions, which are based on the ground in local communities (B. Van Dijken, Yukon IPY Coordination Office, pers. comm. 2010). At an international level, the Arctic

Council, formed in 1996 to facilitate international cooperation on environmental protection and sustainable development issues, supports the valuing of traditional knowledge by giving permanent participant status to six indigenous organizations.

Even with such shifts, differences in underlying worldviews can make it difficult for indigenous and non-indigenous knowledge systems to mesh. For example, funders place great stock in the résumé of a principal investigator as the expert leading a research team. From the TH government's perspective, the key experts to involve in traditional knowledge work are elders. In other words, the expertise available to a project really depends on the quality of the relationships between the project team and the community members taking part in the research.

Quality of Knowledge, Quality of Trust: Contexts of Relationship

One of the most important competencies that the TH Heritage Department brings to a traditional knowledge research project is strong relationships with members of the TH community. TH knowledge holders can feel confident entrusting their information to Heritage staff for several reasons. First, because the TH government is their government, citizens can exercise a degree of control through representative channels such as voting. This is especially true with a small government in a small community—while there may be issues with the distribution of benefits, they remain at the local level: knowledge stays in the community, rather than being housed in distant museums, archives, and libraries that local people cannot easily access. Nadasdy (2003:195) highlights that a key test of the validation of knowledge is whether governments are willing to act on it. While non-First Nations governments rarely act on traditional knowledge without requiring corroboration with scientific information, TH Heritage routinely contributes traditional knowledge to curriculum development, language education, and other programs and activities. The TH government uses traditional knowledge in decision making. This practice is an important way to build trust in the community and show that the government is worthy of that trust.

The extensive draft TK policy also increases confidence of individuals and families to share their information. Developed from a template created in conjunction with other Yukon First Nations and in consultation with legal experts, the policy carefully takes into account the right of knowledge holders to control how their knowledge is used. The policy includes an expansive understanding of prior informed consent that ensures that knowledge will be used for the stated purposes and that knowledge holders will be consulted if there is any confusion or lack of clarity about either their information or access to it. This policy is an advantage to any research partners of the TH government. It is a tailored and appropriate guide for research with the TH community that protects the community's interest: properly applied, it could streamline some of the more cumbersome ethics review processes that discourage academic partners. Internal evaluation by the TH Heritage Department has suggested that the various regulatory processes required to conduct TK research, which include those prescribed by the *Yukon Scientists and Explorers Act*, university ethics review processes, research grant applications, and First Nations government review, not only place a heavy burden on researchers, but also make it complicated for participating communities to understand research projects (Neufeld and Parsons, 2011). Having several documents with varying descriptions of the research creates a kind of systemic barrier to opening straightforward communication: it would be much easier to clearly and simply convey research purpose and methods to community members if this could be done through a single entry point. For the traditional knowledge and climate change project, the TH government applied its TK policy and did not require any further ethics reviews of its academic partners.

Among others involved in northern research, Pearce et al. (2009) have noted that developing good community relationships is difficult and time-consuming; that it is essential for researchers to spend time in the community; and that communities and individuals can still feel taken advantage of in the research relationship. The TH Heritage Department has long-term relationships of care with community members. These are generally far deeper and more nuanced than relationships that can be nurtured by university-based researchers, who spend comparatively short times in the community (Fienup-Riordan, 1999; Collings, 2009). The relationships of care nurtured by the Heritage Department exceed the bounds of specific research projects, and in some cases they include kin relationships with knowledge holders. Both the department and individuals within it have an enduring community presence and are committed to providing training and mentoring to youth and other cultural supports, as appropriate, to the entire community.

These community relationships contribute to TH Heritage's crucial competency in accessing TK holders and identifying those who can best contribute certain kinds of information. With this competency comes great responsibility: the quality of TK information that feeds into governance processes outside of the TH government itself—for example, into an environmental assessment of a mine site proposal—depends very much on the correct people, with the relevant expertise, being willing to contribute information. In self-government and land-claim negotiations, Yukon First Nations fought for and obtained guarantees that traditional knowledge would be considered in decision making on land and resource issues and that First Nations would be consulted on such decisions. When necessary, First Nations are able to use their consultation powers to ensure that the TK included in a development proposal is satisfactory in quality and reflects the community consensus on relevant knowledge and knowledge holders.

The TH government and other Aboriginal governments do not have a similar consultative role or authority when it

comes to ensuring that academic researchers have included the most relevant traditional knowledge holders in their projects and papers. Although peer review processes ensure the quality of research according to academic protocols, no similar formal processes exist to ensure rigour in traditional knowledge research from a First Nations perspective. Research protocols encouraging increased communication and community consultation have improved comprehension and interpretation of traditional knowledge in academic settings. However, as these mechanisms are largely informal and may not include TH government review of publications intended for academic audiences, the TH Heritage Department has found that some academic research that circulates and is considered authoritative does not fully resonate with local understandings.

To do quality TK research, it is essential to identify the widely respected knowledge holders in each relevant domain and for these people to be willing to share their information (Huntington, 2000). The processes involved are far more complex and nuanced than simply getting a letter of support from a governing council or community agency; however, only rarely does this essential research component receive more than a cursory discussion in the methods section of academic research papers. Lacking context to evaluate whether they have spoken with the most appropriate knowledge holders, non-community based researchers may assume that they have better community access than they really do. This is one reason why it is important to recognize the TH Heritage Department as a repository for researchers seeking TH traditional knowledge. A frustration for Heritage Department staff during the IPY funding application process was the relative invisibility to outside evaluators of the core competency flowing from the department's relationships and standing in the community. While it is routine in application processes to ask for support letters from indigenous community representatives such as the Heritage office in order to validate academic researchers' community credentials, funders seem to lack the means to recognize the standing of indigenous government and community-based researchers when they apply in their own right as experts at locating and accessing the expertise within their communities.

In discussing community relationships, Pearce et al. (2009) noted that the comfort level of interviewees increased when the interviewing teams included members of their own community. The TH Heritage Department has also found this to be the case, particularly if a TH youth is part of an interview team. Including a youth member fits with the emphasis many elders place on sharing information with younger generations. Additionally, knowing the individuals and families involved in the project increases the investment of interviewees. Certain elders spoke only because of their connections to TH citizens involved in the project. Especially in the case of trips to Eagle and Fort McPherson, hospitality and participation came about because the research team could tap family ties within the TH community. On the researcher side, at least one indigenous TH researcher reported feeling personally enriched from learning and hearing stories that are part of her heritage (Hunt, 2010).

The Heritage Department is constantly working to build relationships and earn the trust of community members. Staff cultivate awareness of their place in the community and think carefully about how Tr'ondëk Hwëch'in ways can be respected within a contemporary TH government. Part of the Heritage Department's TK method is to be aware of the great generosity of elders in sharing their knowledge with the Heritage Department even though staff members have made mistakes out of ignorance. An attitude of humility is important to any successful traditional knowledge method, especially for outside researchers. It is an act of reconciliation and courage for community members to entrust their knowledge to researchers despite the personal harm they may have suffered from residential school and from other government initiatives that devalued TH language, ways, and culture. First Nations people cannot help but be aware of this legacy; researchers do best if they also have some understanding of this context and appreciate that a research interaction involves not only the researchers' project or institution per se, but also a broader history of community experience with academic learning and government intervention (Clarke and K'änächá Group, 2009).

Trust builds over time; the Heritage Department has been able to build relationships with a number of research partners who have been reliably present over the years and have shown confidence in and ability to work with TH research approaches.

Cultural Understanding and Narrative Methods

Another of the working definitions for Tr'ondëk Hwëch'in TK (Tr'ondëk Hwëch'in Government, 2009b) is that this knowledge includes but is not limited to language (including place names and legends), identity, culture (including social protocols, relationships, customs, songs, dances, art, spiritual practices), elders, environment, survival, and prophesies. It takes a lifetime of experience to understand the culture and context in which this knowledge reaches its fullest breadth and potential. For example, some of the information offered in the IPY project could be classified as "prophecy," "story," or "myth," as it concerns spirituality that is of value specifically to TH people. The importance of this sensitive information can be understood only within the Tr'ondëk Hwëch'in reality, and the knowledge might not have been offered to researchers not working within a TH government-sponsored research project. In order to encourage the use of TK, Renewable Resource Councils and other co-management bodies in the Canadian North have recognized the different "levels" of such knowledge by establishing special safeguarding processes or protocols that ensure that information given may be used only in specific instances or contexts and otherwise will not be released. To the extent that TH Heritage has established good relations through long-term community presence

and the support and cultivation of TK, knowledge holders involved in the Climate Change project shared some profound kinds of information (for example, information about spirituality) that require a significant depth of cultural familiarity. Spiritual and mythical forms appear only in a cursory way in the academic research paper component of TH Heritage's climate change project—as Ellis (2005:72) in particular has noted, myths, values, and other subjective, non-positivist contextual elaborations are especially likely to be discarded as traditional knowledge is "scientized" (Agrawal, 2002) to fit within a system that places a premium on replicability, rationality, empiricism, and universality. However, such knowledge, though relatively invisible the farther out one gets from tangible involvement in the lived project, plays a significant role in the various programming and cultural activities that the Heritage Department supports as a part of maintaining the living culture of TH TK. The climate change project thus helped sustain and cultivate a crucial aspect of traditional knowledge that is rarely nurtured by academic research projects.

As previously discussed, TK arrives through the people and their relationships to each other and the land. The quality and type of information offered from that perspective is different from what scientists and social scientists more regularly gather. For instance, the knowledge may be narrative in character and concerned with kinesthetic experiences of closely observing qualities that are relevant to survival. Examples could be information about the texture and tastes of traditional foods, or information about the variability of thickness and quality of furs that is interspersed in a longer narrative describing a family's pattern of travel over several winters. Berkes (2009) notes that this kind of knowledge forms a vocabulary and skill set for reading critical signs or indicators of what is happening on the land: its value lies less in the individual observations than in how, through constant interaction and experience, TK practitioners are able to convert observations and facts into a means of understanding and adapting to subtle changes in the environment. By its very character, traditional knowledge reveals important information about those who share it. In this project, for example, TK gave indications of what people in a small northern community value, how they think about environmental change and how it affects them, and where gaps exist in climate change understandings. These factors, which form a core of the project learnings presented in TH Heritage Department and Friendship (2011), are crucial if the IPY project knowledge is to be put to use effectively at the local level.

Over many years, the TH Heritage Department has developed ways of working with the kinesthetic, conversational, and narrative facets of traditional knowledge. A growing body of research describes how indigenous oral history and storytelling work within Yukon and Northwest Coast indigenous cultures, as well as the rich knowledge contained within these forms (Cruikshank, 1998; Profeit-Leblanc, 2002, 2004; Archibald, 2008). Standard qualitative social science methodologies such as questionnaires and structured interviews do not lend themselves to accessing storytelling, and they can fall short in garnering the breadth of traditional knowledge that TH citizens have to offer. Overly structured interviews may tire out interviewees, who feel that their expertise is not being properly tapped and that they are being asked repetitive or irrelevant questions. In common with other researchers working in northern communities (Cruikshank, 1998; Huntington, 2000; Collings, 2009), the TH Heritage Department has found more success from adapting its interview styles to suit the narrative and conversational nature of TK transmission. As Huntington (2000) has observed, such semi-structured interviews allow discussions to flow according to the associations made by the participants, revealing new knowledge in areas of inquiry that the researcher might not have known to ask about. While TH Heritage Department interviewers have lists of questions and areas of interest to explore, they do not follow one standardized template for every interview. Rather, they guide the interview toward specific areas where the interviewee has more expertise and interest and omit other questions as appropriate. Conducting such an interview or more "natural" conversation well requires skill, experience within TH culture, and a healthy relationship between interviewer and interviewee (Hunt, 2010).

Sometimes the TH Heritage Department has encountered resistance to its interview methods from potential partners or the government and academic institutional cultures in which such partners work. The frustration with narrative methodologies felt by those not trained to use them is often expressed as a questioning of the integrity or validity of these methods. In recent decades, as Ellis (2005) has documented in some detail with reference to environmental decision-making bodies in the Northwest Territories, such critiques have often taken the form of rejecting traditional information, framed as stories and individual experiences, as merely personal opinions or anecdotal, non-generalizable information of little relevance for decision making.

Throughout colonial and post-colonial history, oral histories of Aboriginal people have been dismissed in instances where they contradict official accounts. Oral accounts are considered less trustworthy than their written counterparts. Mildon (2008) and Cruikshank (1998, 2005) have both demonstrated that when equivalent tests of consistency and fidelity are applied to historical documents produced by explorers, missionaries, or government officials, Aboriginal oral testimonies emerge as more credible than interpretations by colonial officials whose perspectives were clouded by racial prejudice and a lack of cultural understanding. When it comes to scientific papers with conflicting findings, or court cases in which a judge and jury must discern between inconsistent accounts, it is not standard practice to discount all testimonies simply because the perspectives do not agree. Oral histories, likewise, should not be dismissed because on the surface or to the untrained reader they do not offer up an easy interpretation. The complexities and nuances of traditional knowledge can be deciphered; the

task just requires cultural familiarity and grounding in relationships with the knowledge holders in order to develop the appropriate skills of discernment.

Traditional knowledge is not significantly more subjective than knowledge developed through any process that requires human discernment, such as making and recording scientific field observations. Nadasdy (2003) discusses how Kluane hunters and trappers, who had learned how to observe sheep and wildlife through years of experience on the land, frequently felt frustrated by the quality of scientific data on wildlife populations that was used in decision making. These hunters could spot the presence of sheep through minute cues, such as a few hairs on bark; through their observation and tracking skills, they drew detailed conclusions concerning sheep behaviour, health, and activity on the landscape. In contrast, government field biologists used intrusive methods such as low-flying helicopter counts, which interfered with natural animal behaviour, to collect occasional snapshots of populations. These counts depended on the skills of pilots and counters to approach and spot white sheep rapidly fleeing on white snow, and on the accuracy of population modeling. Yet the figures extrapolated from them were accepted by biologists as more reliable than Aboriginal testimonials even though neither the scientific models nor the scientific methods could objectively be proved more accurate. In practice, scientific knowledge trumped traditional knowledge: the sheep management committee that Nadasdy analyzed was willing to make recommendations only if scientific knowledge could be seen to back them up, as even committee biologists sympathetic to TK believed that decision makers in government would countenance only science-based arguments. The greater depth of historical understanding of sheep populations that TK could offer was ignored, not because this information was inherently less valuable than the scientific information, but because it was incommensurate with the way in which non-Aboriginal committee members were able to value and judge information (Nadasdy, 2003). Bocking's (2007) and Sandlos' (2007) historical research reveals that similar valuations of conservation science have guided northern Canadian wildlife management policy for the last several decades.

Rather than being less rigorous, narrative information is frequently richer than information from more boxed-in kinds of data collection. Irlbacher-Fox (2009) uses examples from land-claim and self-government negotiations to illustrate ways that Aboriginal people may be silenced by narrow formats, protocols, and attitudes that exclude or deem irrelevant many key facets of Aboriginal experience. For example, stories of suffering—such as those concerning residential school experiences—may be met with the non-response of awkward silence. Forms of dialogue and research that are prescribed by narrow legal, policy, and program language frequently act to shut out important narratives and alienate Aboriginal people in ways that may be invisible to the institutions in question. For example, in the academic research process, university ethics reviews often require a specific type of written consent form from interviewees. While the form is meant to protect the interviewees, its language and textual forms may put the interviewee on edge and have the effect of emphasizing the threats and possible negative consequences of research participation. Paired with a restrictive, structured interview format, such protocols can narrow rather than ease the research relationship, making participants more hesitant to trust researchers and share information. For gathering traditional knowledge, conversational and narrative interviews, which put interviewees at ease so they can share their insights in a more natural way, are often more effective than ways of speaking that tend to exclude Aboriginal participation.

The "problem" of understanding Aboriginal oral testimony exists whether one uses standardized or conversational interview formats: it is really a problem of discernment on the part of researchers. In either case, cultural context plays a great role in making and understanding meaning. As Irigaray (1996) has pointed out, it is all too easy to assume that we are speaking the same language just because we share the same words. However, TH citizens may use language differently (Parsons et al., 2007). Even a relatively simple term such as "caribou" can carry all kinds of meanings and associations within TH culture that are not readily apparent to an outsider. Interpreting narrative speech is a skill that develops with experience in TH culture and with building relationships to the speakers who are knowledge holders. Without this competency, it is easy to skew data by improper aggregation, in which less important points are emphasized, leaving out what speakers most wanted to get across. In the experience of the Heritage Department, a better quality of knowledge is achieved when narrative methods are used within a context of strong relationship and investment between researcher, community, and knowledge holders. An example is the added value gained from community youth doing interview work, as described in the next section.

More generally, the TH Heritage Department designed the climate change project so that its staff members—who are heavily invested in the community and known to the individuals interviewed for the project—conducted the oral history interviews. The Heritage Department considers this approach to be a "best practice"; its recognition as such by other researchers would greatly ease TH partnerships. This shift requires granting agencies, governments, and academic institutions to develop a greater familiarity, comfort, and facility with narrative and conversational methods so that these approaches can be considered on par with other methods. It may also require parties to examine their unconscious biases. Partner anxiety about other ways of doing research often takes the form of extensive requests for documentation and justification of local credentials, training, and work methods, making it far more time-consuming and costly to apply for funding for a community-based project than for an equivalent project put forward in a more conventional form by a lead academic researcher in a recognized institution. In the experience

of the Heritage Department, evaluative processes for partnership grants tend to favour large pan-northern projects using social science methods that allow for standardization and comparison across case study communities. The traditional knowledge methods described above—in which each case and each context requires its own approach—are more difficult for other institutions and governance forms to accommodate.

Supporting Living Knowledge

Much more is conveyed in traditional knowledge than can be contained in a text. For example, a great deal is communicated through tone, gesture, and relationship between speaker and listener. Values can be conveyed even with no words spoken. For instance, the way an elder travels along a trail can demonstrate respect for the land. Kinesthetic knowledge and skills, such as how to skin an animal and prepare the hide, can be fully learned only through practice: techniques are mastered by making mistakes, correcting or being corrected, and watching, learning, and trying again.

TH Heritage exists to support the ongoing, lived practice of TH culture and knowledge. As Parsons et al. (2007) explains in detail, an essential, inseparable part of TH traditional knowledge is its lived practice. Just as archival material and cultural objects lose their integrity when they are not made available to support TH culture in its lived practice, so too traditional knowledge can be diminished if it is extracted into texts without attention being paid to supporting present and future knowledge holders.

Wherever possible, IPY project methods supported the lived practice of traditional knowledge. Project activities validated this knowledge and its holders, strengthened the collective and collaborative role of the community in supporting TK, and encouraged stewardship within the TH traditional territory. Oral histories and their transcription and analysis were part of this process, but they were only one of many outcomes that helped nurture TK in the community. Other benchmarks used to measure success included whether the project cultivated and strengthened relationships (for example between elders and youth, or between participants and a particular landscape or heritage site); whether participants learned or practiced traditional skills; whether the project validated TK and instilled confidence in TK holders; and whether the project results circulated in the community in ways that created conversations, helped to renew practices related to the investigated knowledge, and led to future investigations or applications that benefited the community.

Over the years, the TH Heritage Department has developed programs that pay attention to knowledge holders, to knowledge in its lived practice, and to the networks of relationships that bind these together. It is the department's perspective that traditional knowledge research is best undertaken in conjunction with activities that support the lived practice of traditional knowledge. Wherever possible, throughout the research process, the Heritage Department integrated knowledge gathering with "knowledge-in-practice" activities for project participants. An example of this integration is the interviews conducted by young people using the traditional knowledge kits. Through this process, the young interviewers gained oral history research skills and learned to conduct respectful interviews with prior informed consent. Many youths were stretched out of their comfort zone in initiating contact with elders (Cooke, 2010). Speaking with elders about the land was an opportunity to instill pride and respect for elders' knowledge. This was particularly the case for the interviews conducted out on the land at TH skills camps, such as the Moose Hunt: the knowledge being shared was relevant to the activities youth were taking part in, and being on the land helped draw out elders' memories. Youth interviews had the additional benefit of drawing in participants, chosen by the youth, who might otherwise not have been identified or agreed to participate. Youth-led interviews further enriched the quality of gathered knowledge because grade eleven students at the local school, as part of an oral history exercise for course credit and the IPY project, were asked to develop questions that would allow them to come to conclusions about local climate change. Some of the most valuable information about the gap between climate science and local perspectives was revealed through this process. Traditional knowledge extends back thousands of years, and citizens draw on a long cultural memory of cycles of natural variability in caribou populations, climate, and other aspects of the local environment. Given the relatively short period in which noticeable warming has been affecting the local area, some consider that recent changes may be examples of natural variability rather than global anthropogenic climate change.

From a TH Heritage perspective, one of the successes of the IPY project was that it created community conversations about environmental change. Getting participants together at a community mapping session or other activity can be a first step for citizens towards more overtly recognizing the value of what they know and taking an interest in the subject at hand. Beyond thanking project participants, the goal of the Environmental Observation Calendar produced by the project was to generate more talk and support a broader revival of cultural practices associated with observing, understanding, and discussing the landscape and weather.

Bringing people together to talk and share traditional skills reinforces Tr'ondëk Hwëch'in ways and creates spaces in which to share and consider new adaptations to environmental change. In the case of elders, conversations can jog memory about traditional knowledge, and also generate opportunities to discuss, compare, and revise knowledge. This peer support and peer review process is especially important in the present day; experiences of the IPY research team indicated that elders felt more hesitant to share traditional knowledge about weather and landscape because the changing local environment made them less certain that their knowledge held true. This traditional knowledge remains extremely valuable: for example, if

weather conditions are more unpredictable now, it is even more important to be able to observe and read subtle cues that indicate the weather is changing (Berkes, 2009). However, because the knowledge can be so crucial to making decisions about travel and therefore survival, an elder can be reluctant to share information she or he is not positive about, which could contribute to a bad outcome (G. McLeod, Tr'ondëk Hwëch'in Traditional Knowledge Specialist, pers. comm. 2010). While it is obvious how training and educational programs support the next generation of knowledge holders, the need for programming that honours, supports, and encourages elders is often overlooked as an integral facet of traditional knowledge work. Headway has been made in community research partnerships in terms of paying honoraria to elders and acknowledging their contributions to publications, but it would be helpful if a larger sense of how research partnership projects could and should nurture and benefit elders within the community would enter more into community research paradigms.

Over the years, TH Heritage has found that validating and supporting elders has been transformational in encouraging several elders to share more of their knowledge and step forward more consistently. For example, the multi-year community healing process documented in *Tr'ëhuhch'in Näwtr'udäh'ą: Finding Our Way Home* (Clarke and K'änächá Group, 2009) helped many residential school survivors reconnect to their heritage, heal from hurt, and feel welcomed within the TH community—all steps that led such elders to share more knowledge and take more leadership. With the IPY project, TH Heritage organized a Spring Gathering, not just to share direct results of the IPY project, but also to appreciate those, particularly elders, who shared their knowledge. Elders from different communities came together on the land, eating traditional foods and taking part in traditional activities as they chose, and connecting not just with living kin, but with ancestors whose graves were in the area.

In keeping with a living knowledge philosophy, IPY project reports to the community took place as much as possible in ways that supported the building of skills and the practice of traditional knowledge. For example, the Spring Gathering included a formal presentation of project results, but also activities such as de-hairing and scraping of caribou hides, and, for youth, a heritage walk to an archaeological site of a multi-family camp. Such activity-based sharing of traditional knowledge is not just dissemination of results: it is a result in itself, a building of traditional knowledge that should be supported and funded as such in TK partnership projects. Just as funding agencies require peer-reviewed papers as a measure of success of an academic project, so too should the bar for "results" of a partnership project include (and fund) the activities and media that circulate and build traditional knowledge in its lived practice. As Berkes and Bonny (2008), Pearce et al. (2009), and a host of other northern researchers have documented, appropriate community media tools such as plain language summaries, scrapbooks, CD-ROMs, films, multimedia projects, photos, community meetings, and other communications are necessary for research project results to circulate meaningfully in communities. Investment in community media and activity-based TK sharing has measurable effects in cultivating TK locally. Success is evinced by the degree to which people talk about a project or the knowledge from a project, whether they express satisfaction that their contributions led to tangible benefits to the community, and whether there is demand for similar activities in the future. Successful projects feed into community confidence, conversation, and better circulation of traditional knowledge.

Another measure of project success, from the point of view of Heritage staff, will be the degree to which other researchers use and trust the information that is contained in the oral history interviews (Friendship, 2010). Like many Aboriginal communities, TK citizens suffer from "research fatigue." It is hoped that future researchers into traditional knowledge of local environmental change will review the comprehensive oral history interviews that are now on file before—and perhaps instead of—asking to interview TH citizens on similar topics.

Scales of Community and Consequence

Much traditional knowledge information did not "filter up" to the academic papers because it was very local and specific, for example, discussions of specific heritage sites and fish camps that are vulnerable to erosion or trails that have recently become overgrown with willow and scrub. Except at a meta- or aggregate scale, it is not so relevant that such observations be conveyed to an academic community looking for trends in global climate change. Yet these observations are extremely necessary at the local scale. Scientific models and projections of climate change in the Dawson region are limited in their scope and accuracy by the limited number of sample sites in the region and the frequency and time span over which measurements have been taken (Werner et al., 2009). Local governments—both TH and the municipality of Dawson—face a significant research gap in planning for climate change because the scale of current models does not provide the level of detail needed for infrastructure planning. For example, permafrost stability varies within the region but will become increasingly important at the micro-scale for maintaining or moving local infrastructure. The traditional knowledge and climate change project provided some essential local information that can be used to further protect heritage sites, trails, and structures and camps that support subsistence and trapping lifestyles on TH territory. The project also highlighted some of the significant research gaps that TH as a government faces in trying to anticipate and serve the needs of TH people.

FURTHER REFLECTIONS ON PARTNERSHIPS

In an effort to illustrate strengths that a First Nations government can bring to traditional knowledge research

with its citizens, the earlier part of this paper has focused on methods. We hope that this elaboration can help academics, governments, and funding agencies better appreciate and evaluate the competencies of First Nations organizations as researchers, so that First Nations government expertise can be considered on a par with other government departments and university researchers. Many individuals in government and academia are already working in partnership with First Nations and northern communities in this respect, undertaking the difficult work of helping to shift institutional practices. Over the last many years, much fine research and many discussion papers and policies have proposed more active roles for northern communities in determining research agendas and research funding and recommended capacity building and information sharing networks that are geared towards northern communities (Abele et al., 2006; Christensen, 2008; Easton, 2008; Pearce et al., 2009, 2011; Angell and Parkins, 2011).

Decolonizing Financial Relationships

One particular area of challenge for the TH government—financial relationships—merits further discussion. One of the best ways for academics and other levels of government to help facilitate better research partnerships would be to put the same reflection and energy that has gone into decolonizing working relationships with First Nations into helping to decolonize financial relationships. Issues of funding were the most demoralizing and greatest stressors for the TH IPY project coordinators: 30–40% of their total working hours were allocated to activities such as tracking funding that had not arrived, completing and sending or resending reporting, refining funding proposals that required a great deal of negotiating, and reapplying for funds that could not roll over into future years when the project experienced relatively short-term or normal delays. Many of the challenges occurred because financial systems—assumed by their creators to be value-neutral processes of accountability—are created to be as administratively efficient as possible for government, without adequate consideration of how such systems do or do not mesh with the realities of a First Nations government. For example, often specific project funding is tacked on as one more part of a very complex contribution agreement covering all funding transfers from a particular agency to a First Nation. This can result in significant monetary delays, and it may mean that the actual release of funds is tied to events totally unrelated to the project. In such cases, much energy can go into locating and communicating with the correct office. Miscommunication on the nature of the holdup can be prolonged and lead to unnecessary work. Another example of a financial bureaucratic hurdle is that the entire TH government may be one "account" for a government funder. It would be extraordinary for a university researcher to find his or her research held up because of a complication with another researcher in another department, but the structuring of financial relations makes analogous delays the lived reality of First Nations governments. It is not uncommon for money to be held up for months or even years. Since First Nations governments have less stable funding to begin with and less dedicated money for research, such delays put real stresses on cash flows and financing of research projects. While it is understood that research funders may delay funds for various reasons, the same flexibility is not always built into contribution agreements for project partners. In the case of IPY, the lack of "roll-over" was a significant issue, not just for the TH project but for many projects in northern Canada. IPY did its best to find new funds for education and communication projects; however, busy project managers still had to re-apply for funds, facing potentially stressful shortfalls for projects already underway and expenses already incurred. Such circumstances could be avoided in future with more flexible funding arrangements.

Bureaucratic funding delays and disruptions can be particularly discouraging in a First Nations governance context, because they are articulated to a long history of First Nations people having to prove themselves and "measure up" within paternalistic systems that viewed them as imperfectly assimilated white people. In keeping with such a worldview, funding delays and processing problems are often framed as an accountability issue with First Nations who have not properly mastered reporting procedures. This perspective can mask the fact that the complexity and flexibility of procedures, clarity of communication and accountability channels, and speed of financial processing may be different for First Nations than for other research partners, particularly if transfers to the First Nation take place through a gateway or third-party agency. First Nations governments, which must hybridize traditional forms of indigenous governance and the forms of Canadian bureaucracy (Kulchyski, 2005), struggle with being perceived as "immature" versions of their territorial and federal counterparts, rather than as distinctly different governments that are suited to the aspirations and rights of First Nations people. Research funding arrangements that are inflexible, or which impose unwieldy reporting requirements that may not assure accuracy and accountability in a First Nations context, are oppressive as well as impractical, as they reinforce negative and inaccurate stereotypes and drain away staff time that could be more valuably spent. A concerted effort to decolonize funding flows—mostly through small, simple changes that are just as accountable but also more appropriate—could significantly improve future research partnership experiences.

Partnership Challenges and Opportunities

As a self-governing First Nation, Tr'ondëk Hwëch'in endeavors to live well and in harmony with its neighbours. This endeavor requires mutual understanding, which must be developed across difficult histories and present inequalities. Research and research partnerships are an important source of hope because they can shift understandings of First Nations' struggles and focus in constructive ways on

the challenges and successes of Aboriginal people. The IPY project provided significant benefit to the TH government and community. At the same time, the project was a new kind of partnership, with areas where TH would like to do better, as well as emergent opportunities for research partnerships to move the community forward.

The TH Heritage Department was not able to complete the archival portion of the traditional knowledge and climate change project although it was prioritized in the original proposal. While TH has thousands of hours of oral history tapes, very few of these tapes have been transcribed according to TH's TK policy. The backlog in transcription and associated procedures, such as reaffirming permissions and entering the transcript into a searchable database, make it nearly impossible for the archive to achieve its full potential as a traditional knowledge resource. The tape collection goes back many decades, to before the formation of the Heritage Department. Given the department's limited resources, and the pressure to continue learning and documenting the knowledge of present-day elders, it is difficult to prioritize coping with the backlog.

The backlog itself, rather than specific concerns about sensitivity of certain portions of traditional knowledge, creates the main access barrier for both TH and non-TH researchers seeking traditional knowledge. The longer the backlog persists, the more likely it is that more information will be highly restricted: according to TH standards of prior informed consent, tape transcripts must be checked back with the original speaker, and the conditions for sharing the information must be clarified. This procedure becomes much more difficult if the original speaker has passed away or moved to another community. It is in the best interest of both the TH government and potential academic and government partners to support the transcription and classification of archival audio tapes, particularly as these steps allow more of the collection to be digitized and made more accessible to researchers. Libraries, museums, library science faculties, and oral history institutes could all be strong partners for such a project. The archive also represents a great opportunity for researchers working in digital storytelling and new media technologies to support TK work. For example, the Reciprocal Research Network (2012), a partnership between the Musqueam Indian Band, the Stó:lō Nation Tribal Council, the U'mista Cultural Society and the UBC Museum of Anthropology, developed an online research environment that could be programmed to meet the specific access strictures and sensitivities of First Nations cultural objects. This allows a database of items to be maintained online, giving wider access to items that are in museum collections around the world. The TH government could also benefit from being better able to maintain and share its archive in new media forms.

Another emergent partnership area, which is more specific to the IPY partnership, is reconciling the gaps between scientific understandings of climate change and local common sense. The local northern communities IPY coordinator tried to provide many opportunities for TH project staff to attend IPY events. However, in practice staff felt pulled between benefiting IPY through attending results workshops and other events and losing the time that multi-day trips across thousands of kilometers took away from working on the project in the community. While result dissemination workshops were held in Inuvik and Whitehorse as part of an effort by territorial IPY organizers to share knowledge locally, the IPY knowledge dissemination model tended towards bringing researchers and one or two community members to a central hub far away from most communities. Because climate change is such a crucial northern issue, it is worth considering whether there could be more effective ways to bring "global" snapshots and perspectives on climate change to small northern communities. For example, perhaps it would be possible to work more with local agencies like the Yukon's Northern Climate Exchange and expand the concept of reporting back to communities from just being about local projects to more emphasis on the larger work of IPY in understanding environmental changes in polar and Arctic regions. While the TH IPY project coordinator and the schoolteacher involved in the youth oral history project both incorporated some larger-scope IPY and climate change information into their outreach efforts, these could have benefited from greater support and resources.

Finally, it is worth acknowledging that some of the methods that the TH Heritage Department chose made work more difficult for the academic researchers. In particular, as discussed, there were many good reasons for TH Heritage to conduct most of the project work. The trade-off was that the academic researchers had less time in the community and experienced a greater sense of disconnect in working mainly with audio tapes, files, and transcripts that they had not produced (K. Friendship, pers. comm. 2010). The Heritage Department tried to address this gap in various ways. Researchers were invited into the community on several occasions, not just to participate directly in project activities but to attend other events, such as First Hunt. TH Heritage staff created a framework to communicate with the academic team and check in as necessary. Finally, the leader of the academic team had many years of partnership experience with TH, and the lead author on the paper summarizing interview results, through previous research experiences, had come to know many of the interviewees whose knowledge she was aggregating. While these measures to some extent bridged the gap, academic team members felt it would have been helpful to have more contact and a greater sense of closure on their community involvement related to the project.

CONCLUSION

The *Documenting Traditional Knowledge in Relation to Climate Change* project was a rare opportunity to have TH research supported by and shared with broader academic and government bodies, allowing different bodies of work to count as knowledge. The project allowed the TH

government to gain much needed information on how climate change is affecting the traditional territory and lives of Tr'ondëk Hwëch'in citizens and to put this information in perspective with respect to what traditional knowledge reveals about local environmental change in the past. Without the partnership of the International Polar Year, the TH government may not have had the opportunity to conduct its research in such depth or in as timely a fashion. Additionally, the community would have had less opportunity to make this knowledge "live"—to revive or continue cultural activities linked to weather and landscape observation, to begin community conversation on adapting to changes on the land and to traditional foods, and to share skills and educate the next generation. The project has had concrete outcomes both for the academic community, in the form of research papers, and for the TH government, which has identified and begun new research projects concerning specific areas of climate change vulnerability to which the community will need to adapt. Finally, the project has helped build mutual understanding of how First Nations governments, the International Polar Year, and academic and government partners work, and how they can work together. *Documenting Traditional Knowledge in Relation to Climate Change* was but one of several projects in which IPY and First Nations people developed new partnerships. The evolution of these ways of working, which both better support First Nations traditional knowledge and build stronger relationships between First Nations and others in the research community, augurs well for the future. We hope that this paper, in elaborating the workings of one specific partnership, can contribute to supporting future research partnerships and to improving the quality of life within the Tr'ondëk Hwëch'in traditional territory and in other northern communities.

ACKNOWLEDGEMENTS

Thank you to the Tr'ondëk Hwëch'in community and the Tr'ondëk Hwëch'in Government (Heritage Department), owners and keepers of Tr'ondëk Hwëch'in knowledge and custodians of the methods of Tr'ondëk Hwëch'in knowledge cultivation described in this paper. Thank you to the interview participants in Dawson City, Yukon; Fort McPherson, Northwest Territories; and Eagle, Alaska, without whom the *Documenting Traditional Knowledge in Relation to Climate Change* project would not have been possible: Angie Joseph Rear, Alex Taylor, Benjamin Juneby, Carrie Docken, Charlie Snowshoe, Doris Itsi, Doug Fraser, Dan Reynolds, Dave Robinson, Frank Blanchard, Gaetan Beaudet, Grant Dowdell, Glen Everitt, Gladys Netro, Isaac Juneby, John Borg, Jane Charlie, Jack Fraser, James Leary, Julia Morberg, Jackie Olsen, Jack Semple, John Semple, J.J. Van Bibber, Ken Snider, Linda Taylor, Margaret Caley, Mark Elliott, Michael Fraser, Michael Mason, Neil Colin, Percy Henry, Peggy Kormandy, Peter Nagano, Quinn Guimond, Robert Alexie Sr., Rose Fields, Rachel Hunt, Ronald Johnson, Roger Mendelsohn, Sonja Sager, Stuart Schmidt, Sue Dragoman, Tony Beets, Tommy Taylor, and Walter Alexie. Thank you to all the youth who conducted interviews for the project, including the Grade 11 class at Robert Service School led by Jessie Cooke. Thank you to those interviewed about their IPY project experiences for this paper, and to those who shared their insights in meetings and correspondence: Jody Beaumont, Jessie Cooke, Chris Evans, Katelyn Friendship, Tim Gerberding, Bruce Warnsby, Rachel Hunt, Georgette McLeod, Jackie Olsen, Sue Parsons, Bob Van Dijken, and Allie Winton. Thank you to the Tr'ondëk Hwëch'in IPY Academic team editorial committee for their support and guidance throughout the project. We would also like to acknowledge all other people who participated in the IPY project, including David Neufeld, Erin Neufeld, Jennifer Mierau, Nicole Cook, Madeline deRepentigny, Trish Hume, Wayne Potoroka, Dorothy Alexie, Elizabeth Colin, and Doreen Olsen. And for financial support, thank you to the International Polar Year, Government of Canada.

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