Knowledge Appurtenancy:
Universities, Regional Development, and the Knowledge-Based Economy

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Abstract

The emergence of the knowledge-based economy has challenged non-metropolitan regions that have traditionally engaged in the extraction and export of natural resources. These regions require government policies that will enable them to participate in an economy that now favours human capital over resource endowments. Appurtenancy is one such policy. Originally used in the management of water and forest resources, appurtenancy provided the conditions for regional sustainability by formalizing a relationship between a community and its adjacent resources.

This thesis presents the characteristics of appurtenancy and applies them to new northern universities in British Columbia and Manitoba. The data from these case studies provide evidence of how the universities have a strong relationship with their regions and embody a new social contract involving these regions and the state. At its foundation, knowledge appurtenancy is based on regional responsibility and providing the capacity for sustainability in a knowledge-based economy.

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An Introduction to Knowledge Appurtenancy

In the definitive book about former British Columbia Premier W.A.C. Bennett, David Mitchell describes a turning point in the political life of the new premier and the province he had only recently been elected to lead. Bennett was reportedly gazing out over the Peace River Valley when he was confronted by a local trapper who asked the Premier what he was staring at. "'Well, my friend,' said Bennett, 'I see dams. And I see power. And I see development. I see roads, highways, bridges and growing communities. I see cities – prosperous cities with schools, hospitals and universities.'"[1]

Bennett is considered by many to be the original champion of British Columbia's vast, resource-rich hinterland. He was an early architect of government action oriented to the economic development of the entire province. This action took two paths: investment in infrastructure – roads, railways, and hydroelectric dams, for example – and initiation of government policy aimed at regional development. In fact, it was Bennett's Social Credit government that used appurtenancy as a foundation of its forest management approach. Appurtenancy provided the conditions for community sustainability by requiring forest company licensees to process timber in the same region where it was cut. It was an integral part of a government vision that sought to establish and stabilize resource-based communities around the province.

[1] Mitchell, *W.A.C. Bennett and the Rise of British Columbia*, 255.

If Bennett was alive in 2008, gazing out across British Columbia's northern region, what would he see? He would see that, thanks to an economic boom and government policies such as appurtenancy, many of his predictions had come true. Starting in the years immediately following World War II, and coinciding with Bennett's rise to political power, the northern part of the province rode the same wave of economic prosperity that was being enjoyed around North America. Spurred by public and private investment, the provincial forest industry grew to global dominance and hydroelectric dams provided abundant and inexpensive energy. The forestry investments, which included the construction of more than a dozen pulp mills throughout the Interior, helped to fuel a population boom lasting for several decades.[2]

Today, Bennett would also see a region at a crossroads. Despite its amazing growth since the 1950s, the population of northern British Columbia peaked in the 1990s and has been declining for a decade. The main reasons for this population change relate to the changing economics and needs of the resource economy. These include technological improvements that have allowed resource industries to reduce their workforces while maintaining or increasing productivity levels, limited regional success with developing a diversified economic base, corporate consolidation that has led to mill closures, and the inability of the region to sustain a value-added industry that would capture greater local economic returns from the resource base by employing local residents. More recently, the mountain pine beetle infestation, the rising value of the Canadian dollar, and a slow-down in American home construction have only fueled concerns about the future prospects of forest-reliant

[2] Halseth et al., "Regional Economic Shifts in British Columbia: Speculation from Recent Demographic Evidence," 319.

communities. British Columbia, however, is not the only jurisdiction to be challenged with the viability of non-metropolitan communities. Across northern Canada – and in resource-based regions around the world – these communities are struggling with a changing resource industry, a changing society, and a changing economy. Where once people such as W.A.C. Bennett saw enormous potential in "the hinterland," more people now see metropolitan centres as the engines of economic growth and prosperity. Consider that while the population of northern BC[3] dropped by more than 24,000 people (an eight percent decline)[4] over the past decade, Metro Vancouver has added nearly 285,000 people (a growth rate of nearly sixteen percent).[5]

While the decline of resource-based, rural areas can partly be attributed to the changing structure of the resource economy, the growth of metropolitan centres has followed the emergence of a knowledge-based economy. It is in this new economy that resource-based, non-metropolitan regions are ill-equipped to participate. The problem is that government policies have not kept pace with the transition from a resource-based to a knowledge-based economy. While governments have abolished long-standing policies designed to promote regional economic development, appurtenancy foremost among them, the resulting void has not been filled by new policies that respond to the requirements of a knowledge-based economy.

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[3] For the purposes of this comparison, Northern British Columbia is comprised of the Regional Districts of Fraser Fort George, Peace River, Bulkley Nechako, Cariboo, Central Coast, Kitimat Stikine, Northern Rockies, and Skeena Queen Charlotte.

[4] For a geographic representation of British Columbia's regional districts and population figures from 1991, 1996, and 2001, see http://www.bcstats.gov.bc.ca/Regions/regDist.asp. Data for 2006 was obtained from Statistics Canada: Statistics Canada, *2006 Community Profiles*, http://www12.statcan.ca/english/census06/data/profiles/community/Index.cfm?Lang=E.

[5] Statistics Canada, "Vancouver Census Metropolitan Area," *2006 Community Profiles,* http://www12.statcan.ca/english/census06/data/profiles/community/Index.cfm?Lang=E.

This thesis will describe how appurtenancy, as a policy for regional development, is still relevant in the knowledge-based economy and valuable for sustaining regions that have been dependent on resource industries. Many non-metropolitan regions are having difficulty making the transition to the knowledge-based economy because they lack policy support, a broad range of services, and a population large enough to support a sophisticated knowledge infrastructure comprised of such things as universities and research institutes.[6] Instead, Canada's northern regions, whose resources have traditionally powered the national economy, are still dependent on the extraction of natural resources and are being left behind in this economic and social transition.[7] Contrary to the resource economy – which brought economic and social benefits to regions engaged in resource extraction, in part through an application of appurtenancy that was backed by political will – the continued expansion of the knowledge-based economy in big cities challenges northern regions. Through a review of the literature and data collected from case studies, this thesis will present *knowledge appurtenancy* as a policy option that recognizes the value of non-metropolitan regions.

What is appurtenancy? Appurtenancy has been a government policy that provided the conditions for sustainability by formalizing a relationship between a community and its adjacent resources. In North America, it has been associated with the management of two resources: water and forests. For example, appurtenancy is the oldest water law in the United States and it provided land owners with the right to use water from the rivers/streams that ran

[6] Feldman et al., "The Importance of Proximity and Location" (presentation at the Advancing Knowledge and the Knowledge Economy conference, Washington, DC, January 10, 2005).
[7] Alasia, *Skills, Innovation, and Growth: Key Issues for Rural and Territorial Development – A Survey of the Literature 1980-2003*, 9.

through or adjacent to their property.[8] While this law had important regional development dimensions with respect to agriculture, it also fundamentally recognized that a resource can be most effectively managed by those closest to it.[9] In British Columbia, appurtenancy is associated with forestry. Appurtenancy provisions were implemented by the provincial government when it required a timber company to process trees from a particular area at a particular mill, often in close geographic proximity to where the trees had originally been harvested.[10] Here too, appurtenancy had important regional development effects, because it ensured that jobs and timber processing facilities would be located throughout the province, in the areas that were engaging in forest harvesting. The result was a decentralized forest industry and regional economic/population growth, supported by other government policies and investment in transportation infrastructure.

Appurtenancy was a significant part of a political vision in British Columbia that was aimed at building the economic and social stability of the entire province; not just one or two metropolitan centres.[11] As a result, appurtenancy came to be symbolic of a "social contract" between government, big cities, industry, and the rural/northern communities that provided much of the export wealth for the province. When forestry appurtenancy was eliminated by the British Columbia government in 2003 on the grounds that forest companies required maximum operational flexibility to remain globally competitive, politicians and communities alike wondered whether it signalled the beginning of the end for many resource-based

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[8] Lee and Jouravlev, *Prices, Property and Markets in Water Allocation*, 72.
[9] Choe, "Appurtenancy Reconceptualized," 1915.
[10] Parfitt, *Getting More From Our Forests*, 9.
[11] Wedley, "Infrastructure and Resources: Governments and Their Promotion of Northern Development in British Columbia – 1945-1975," 466.

communities in the North.[12] This fear was being expressed concurrent with the growth of the knowledge-based economy and its centralization in big cities.

The growing recognition of the role of knowledge as a fundamental commodity central to economic growth represents a departure from conventional economic theory in Canada. These traditional theories have been presented by political economists such as Kenneth Rea, Harold Innis, and Donald Savoie, who have described the importance of natural resources to Canada's political and economic history. Over the past fifty years, however, there has been a growing realization that economies can no longer be classified solely in terms of land, labour, and capital. At least one economist has argued that "[i]n the 21st Century, comparative advantage will become much less a function of natural resource endowments and capital-labour ratios and much more a function of technology and skills. Mother Nature and history will play a much smaller role, while human ingenuity will play a much larger role."[13] Knowledge-based economies are those that are highly engaged in the production, distribution, and use of knowledge and information.[14] Activities include education, research and development, communications, and high-tech products and manufacturing. Knowledge-based economies also require higher levels of education and knowledge for a variety of economic and non-economic activities, including health care provision, education and social services, environmental management, and governance. Today, human capital – often realized through education[15] – is seen to be vital to economic growth and regional development.[16]

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[12] British Columbia, Legislative Assembly, *Debates of the Legislative Assembly* (8 May 2003), p. 6624 (Joy MacPhail, MLA).
[13] Houghton and Sheehan, *A Primer on the Knowledge Economy*, 10.
[14] OECD, *The Knowledge-Based Economy*, 7.
[15] See Alasia, *Skills, Innovation, and Growth*, 10; Bollman, *Linkages Between Human Capital and Rural Development*, 1; and Crocker, *Human Capital Development and Education*, i.

This new reality is challenging Canada's non-metropolitan regions, which often lack both the knowledge infrastructure necessary to produce their own human capital and the amenities required to attract highly educated citizens.

As a result, the knowledge economy is based primarily in metropolitan centres. Metropoles provide a high level of services and their large, concentrated populations serve to provide the economies of scale necessary for a sophisticated and comprehensive knowledge infrastructure that includes universities. Unlike colleges or technical institutes, universities play a special role beyond training and engage in the production and dissemination of new knowledge through their research activity. As economies increasingly require this knowledge, universities have been evolving as well, adding regional development to their traditional functions of teaching and research.[17] But unless they are located in non-metropolitan areas, universities are able to divest peripheral regions of the resource most valuable in the knowledge-based economy: the best and brightest people. In such circumstances, modernity does not empower non-metropolitan regions so much as it undermines them and their communities.[18]

This trend appears to be both dire and irreversible. It is borne out by population and demographic trends and the concentration of knowledge industries, research, and universities outside of the resource-producing regions. To reverse it, northern communities need the capacity to participate in the knowledge-based economy. It is easy to make such a statement,

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[16] See Hutton, *BC at the Crossroads: Regional Development Pathways for the 21st Century*,7; Alasia, *Skills, Innovation, and Growth*, 4; and Markey et al., "The Struggle to Compete: From Comparative to Competitive Advantage in Northern British Columbia," 35;

[17] Gunasekara, "Reframing the Role of Universities in the Development of Regional Innovation Systems," 101.

[18] Aga Khan Development Network, "University of Central Asia," www.akdn.org/uca/uca.htm.

but governments have been challenged to make policy decisions that will make it happen. Scholarly research on regional development in the knowledge economy has likewise provided few policy options, though the need has clearly been identified:

> For the industries of the future, the core cities are highly privileged in most countries while the peripheries are generally impoverished and becoming more so, presaging major out-migration of youth and the metamorphosis of such areas into socially deserted or playground economies. **The policy imperative to devise mechanisms by which non-metropolitan regions may, in future, participate in the knowledge-based economy is clearly overwhelming.**[19]

This thesis argues that one policy option should be a rethinking of the use of appurtenancy as a policy for regional development. In this case, it will be framed, not as *resource* appurtenancy, but as *knowledge* appurtenancy. The thesis will examine two case studies and assess the degree to which they are illustrative of the core principles and characteristics of appurtenancy.

The case studies will be drawn from northern Manitoba and northern British Columbia. Each of these regions has a history of resource-extraction on a massive scale and each has witnessed the creation of local universities with regional development mandates. The universities at the centre of the case studies will be the University of Northern British Columbia (UNBC) and the University College of the North (UCN) in Manitoba. UNBC was established by the Government of British Columbia in 1990 and has its core campus in Prince George. UCN is much newer, having added university programming in 2005 after changing its name from Keewatin Community College. Although officially split between two main campuses – Thompson and The Pas – UCN's university-level programming is based in Thompson. Both Thompson and Prince George are northern regional centres that have a

[19] Cooke and Leydesdorff, "Regional Development in the Knowledge-based Economy," 6. Emphasis added.

history of strong involvement in resource extraction: Prince George is one of Canada's premier forestry centres and Thompson is the site of a major mine and processing operation for nickel. Their efforts in establishing universities are illustrative of the growing importance of higher education, knowledge, and innovation in modern regional development.

What do these case studies have to do with a policy that was originally applied to forestry and water management? The connection can be found in appurtenancy's underlying principles and characteristics. At its foundation, appurtenancy provided the conditions necessary for regional development; it allowed a region to benefit from its adjacent resources. Today, natural resource wealth is not considered to be a sufficient condition for regional or local development, but resource-based, non-metropolitan regions suffer from a dearth of relevant policy options that will provide them with the conditions necessary for modern economic development. This thesis will demonstrate that appurtenancy's principles and characteristics can still be applied by governments to assist northern regions in developing the human capacity necessary for making the transition to a knowledge-based economy.

Chapter One

Entrenching Staples: Appurtenancy Then and Now

Innis's seminal message was that Canada had a raw deal by exporting every rock and log as fast as it could.[20]

It would be unusual for a discussion of northern development to not begin with a description of the staples theory. The term, coined by political economist Harold Innis in the early 1930s, recognized the fundamental importance of natural resource extraction in shaping the political and economic evolution of Canada – its provinces, hinterland regions, and metropolitan centres – both domestically and internationally. The theory was first presented in 1930 in the conclusion to Innis's book about the Canadian fur trade, and subsequently re-printed as a free-standing article.[21] In it, Innis pointed out that the fur trade and successive resource extraction activities shaped Canadian dependence on exports and the external markets that have consumed these commodities. Examples through time have included fish from coastal regions, minerals from the northern regions of Ontario and Manitoba, hydroelectric power from Quebec, oil and gas from Alberta, diamonds from the Northwest Territories, gold from the Yukon, and timber from British Columbia.

While resource extraction and export have defined much of Canada's historic patterns of development and settlement, they are not relegated to the past. Indeed, a reliance on resource wealth continues to define Canada today. The fortunes of entire provinces – and arguably, the

[20] Drache, *Staples, Markets, and Cultural Change*, xxi.
[21] Innis, "The Importance of Staple Products in Canadian Development," 3-23. Originally presented in Innis, *The Fur Trade in Canada: An Introduction to Canadian Economic History*. Toronto: University of Toronto Press, 1930.

country as a whole – continue to rise and fall with commodity prices. In northern Manitoba, for example, local residents boast that nickel giant, Inco, still holds the record for the single-largest tax payment ever made to the provincial government.[22] In British Columbia, numerous studies have concluded that the resource-extraction industries continue to be responsible for the vast majority of provincial exports,[23] with the non-metropolitan regions powering the provincial economy at a level disproportionate to their populations.

The crux of Innis's argument is not that Canada engages in resource extraction; this, after all, is more a factual statement than a political theory. Essentially, Innis argues that Canada's economic and political development has depended on the export of marginally processed (if processed at all) resources to fuel the industrial and economic development of other nations or regions. As Innis claims, "[t]he economic history of Canada has been dominated by the discrepancy between the centre and the margin in western civilization. Energy has been directed toward the exploitation of staple products... The raw material supplied to the mother country stimulated manufactures of the finished product... energy in the colony was drawn into the production of the staple commodity."[24] In this case, the "mother country" could be interpreted as England or France, or – more recently – as the United States or Asia. The general pattern Innis presents remains the same: the imperial nation sets the terms of trade and captures most of the profits while the periphery is left with the costs and challenges of getting the staples to market.[25]

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[22] Dan McSweeney (Superintendent for Public Affairs, Inco), interview with the author, 7 Dec 2005.
[23] For examples, see Nagle, *Economics and Public Policy in the Forestry Sector of British Columbia*, 1; Wilkinson, *Globalization of Canada's Resource Sector*, 134; Jackson and Curry, "Regional Development and Land Use Planning in Rural British Columbia," 439; and Baxter et al, *Regions and Resources*, 3.
[24] Innis, "The Importance of Staple Products in Canadian Development," 5.
[25] Weaver and Gunton, "From Drought Assistance to Megaprojects," 192-193.

The staples theory is widely recognized as a major achievement in the development of a uniquely Canadian approach to political economy, but there is dispute about whether it is still relevant to a modern understanding of Canada, primarily its metropolitan centres.[26] While it may be incorrect, for example, to conceive of the entire province of British Columbia as a resource hinterland, it is equally erroneous to state that the province has overcome its dependence on staples and achieved "uniform educational, health, and social welfare programs."[27] Rather, it is reasonable to understand a single province or the entire nation as being comprised of two economies: one being a service-oriented, diversified, knowledge-based economy of the metropolitan centres; the other, a staples-dependent economy of northern and rural regions.[28] Each has been dependent on the other, with the balance of power often favouring the metropolitan centres.

The state has played a key role in fostering staples dependence. In the case of British Columbia, the province joined Confederation with its current boundaries and constitutional authority over land and resources. Only a small portion of the province – located in the northeast – was covered by an aboriginal treaty. More than 95% of the forested land in the province is owned by the state, a practice originally confirmed in 1905[29] and subsequently re-iterated in multiple Royal Commissions on Forestry, beginning in 1909.[30] Keeping the forest in public hands was considered essential for ensuring that it would be managed in the best interests of the province's economic development. Actually developing the system for

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[26] See, for example, Howlett and Brownsey, *From Timber to Tourism*, 1996.
[27] Ibid., 19.
[28] See Davis and Hutton, "The Two Economies of British Columbia," 3; Sitwell and Seifried, *The Regional Structure of the Canadian Economy*, 72; Savoie, *Rethinking Canada's Regional Development Policy*, 50; and Bowles et al, *The Weakest Link*, 2.
[29] Drushka et al, *Touch Wood: BC Forests at the Crossroads*, 2-3.
[30] Green, *Cutting for the Economy's Sake*, 26.

enabling economic growth as a result of public ownership was largely the mission of two Royal Commissions, in 1945 and 1957, led by Gordon Sloan. In his 1957 report, for example, Sloan stated that "[t]he real purpose of our forest policy...is social and economic rather than technical."[31] The policy direction that emerged from Sloan's reports could have included putting public lands into private hands, but *regulation* – also described as a command-and-control system – emerged as the government's policy instrument of choice.[32] The major outcomes were the province's system of tenure and the establishment of a forest management approach based on sustained yield. Described by Patricia Marchak as the "twin pillars of forestry legislation," they were built in the 1940s and 1950s and confirmed in revised forestry legislation in the late 1970s.[33] Employment and stability in the rural regions of the province was cited as a primary objective.[34]

Sustained yield describes a forest management regime that is based on providing a continual and constant flow of logs to processing facilities, based somewhat on the land's capacity to regenerate. The volume of harvesting is determined by the Annual Allowable Cut (AAC), which is set by the Province's Chief Forester. Tenure is the system for providing forest companies with the right to harvest timber from Crown lands and process it in facilities that they own. Common examples of forest tenures are tree farm licences, forest licences, and pulpwood harvesting agreements. In 1997, these three forms of tenure numbered 248 around the province and they consumed 85% of the AAC in British Columbia.[35] As Marchak goes on to describe, "[l]ong term tenures were granted only to companies that built mills. The

[31] Quoted in Byron, *Community Sustainability and Regional Economic Development*, 6.
[32] Stanbury and Vertinsky, "Governing Instruments for Forest Policy in British Columbia," 55.
[33] Marchak et al., *Falldown: Forest Policy in British Columbia*, 18.
[34] Ibid.
[35] Ibid., 16.

requirement that they do so, and requirements since put in place about moving wood through mills in the same region as the cut, are called 'appurtenancy' clauses."[36] This statement positions appurtenancy as the connection between tenure and sustained yield to the primary objective of forest policy, which was to create employment and stability in rural regions. If tenure served as the system for providing companies with access to harvest timber on public lands and sustained yield identified how much could and should be cut, appurtenancy was the connection to local communities and regional stability. Michael M'Gonigle confirms the role of provincial legislation in facilitating this form of economic development, pointing out that "the appurtenance rule (that required a tenure holder to build and maintain a mill as a condition of receiving a tenure) [was] aimed at ensuring economic growth and stability in the province's hinterland."[37]

The importance of appurtenancy to government conceptions of effective forest policy is illustrated by the example of the province's first pulpwood harvesting agreement. The 1962 agreement between the Government and Canadian Forest Products Limited specified the construction of a pulp mill "contiguous to the pulpwood harvesting area" in the Prince George Forest District as one of the five foundational elements of the agreement.[38] In fact, the company was required to post a $500,000 bond to guarantee that the pulp mill would be operational in Prince George within three years of the signing of the agreement and the Government had the right to keep the money and terminate the agreement if this condition was not met.[39] In a PhD dissertation on public policy in BC's forestry sector and its economic

[36] Ibid., 18.
[37] M'Gonigle, "Structural Instruments and Sustainable Forests," 105.
[38] British Columbia, *Pulpwood Harvesting Area No. 1*, 1.
[39] Ibid., sections 14-17.

contributions to the province, George Nagle argues that the province has had to implement regulations such as appurtenancy to resolve the classic problem of how to obtain maximum regional returns from regional resources, asserting that "[t]he elegant and simple proposition of letting free markets govern resource use and allocation is not a viable alternative for this region."[40]

Essentially, then, appurtenancy was an attempt to recognize that a public resource should benefit the public, not just those in metropolitan centres, corporate headquarters, or foreign countries – though they also all benefit from British Columbia's forests. Despite the importance of appurtenancy, it gets less attention in academic publications than other forest policies such as sustained yield and tenure and much less attention in the popular press than commodity prices, the softwood lumber dispute, or industry consolidation. Its low profile cannot, however, be attributed to it being a new concept. Quite the contrary, in British Columbia there have been incentives to process logs locally, rather than export them, as early as 1865.[41] Appurtenancy also has a long history in water management, first in Europe and later in Australia, South America, Canada, and the United States. In fact, among the five types of surface water rights recognized in the United States, appurtenancy is the oldest.[42] According to David Kracman, appurtenancy is "implicit for riparian rights, which means that the right to the water is considered inseparable from the ownership of the land."[43] The word "riparian" is derived from *ripa*, a Latin word meaning "bank of a stream."[44] The dry land,

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[40] Nagle, *Economics and Public Policy in the Forestry Sector of British Columbia*, 188.
[41] Ibid., 46; Curry, "Forest Renewal British Columbia," 593.
[42] Kracman, *Liquid Capital*, 2.
[43] Ibid.
[44] Water Encyclopedia: Science and Issues, entry on *Riparian Rights*, www.waterencyclopedia.com.

therefore, on both sides of a stream or waterbody is considered to be riparian and extends to the edge of the land that drains into the stream.[45]

In an article about appurtenancy published in the *Yale Law Journal*, Olivia Choe writes that "[a]t its core, riparian water law is about the entitlement of those bordering on a watercourse to certain use rights. Under the appurtenancy doctrine, a component of riparianism, only those who own property abutting the relevant body of water are entitled to access and use the water."[46] These rights to use (as opposed to outright ownership rights), however, have limitations. No harm must be done to other riparian right holders[47] and water must return to the stream "as it came naturally to their land: that is the landowner could use the stream without changes to its flow, volume, temperature, and quality."[48] In this respect, water use was seen to resemble a circular pattern.

Water appurtenancy has had its critics. Writing for the United Nations, Terence Lee and Andrei Jouravlev claim that appurtenancy has been inefficient because it "unnecessarily links land, an immobile stock resource, with water, a mobile, flow resource, thereby limiting the potential uses of both resources."[49] Likewise, forestry appurtenancy has been attacked. Along with the tenure system and sustained yield, British Columbia's forest policy seems to have been criticized universally for being inflexible, inefficient, globally uncompetitive, damaging to community stability, and oblivious to the ecological health and sustainability of the forest itself. These criticisms grew through the 1970s and 1980s, as the environmental movement

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[45] Ibid.
[46] Choe, "Appurtenancy Reconceptualized," 1916.
[47] Kracman, *Liquid Capital*, 2.
[48] Water Encyclopedia: Science and Issues, entry on *Riparian Rights*, www.waterencyclopedia.com.
[49] Lee and Jouravlev, *Prices, Property and Markets in Water Allocation*, 72.

gained momentum in the province and a growing gulf was emerging between notions of "industrial development" and "community stability." After the few decades immediately following the end of World War II, employment in the forest industry ceased to grow, especially in relation to productivity. By the early 1980s, technological advances, some over-cutting of the resource, continued dependence on commodity production, consolidation of forest companies, and government preference for large firms were all conspiring against community stability and the supposed intent behind such policies as sustained yield and appurtenancy. In many ways, this represented a natural progression of an industry that depended on world markets for natural resources. The pattern bore striking similarities to what had been witnessed a few decades earlier in the salmon canning industry of British Columbia's north and central coasts, where industry consolidation and improved technology and transportation led to the closure of dozens of salmon canneries in rural and remote communities.[50] History repeating itself did nothing to make the job losses any easier to take in rural communities. From 1980 to the mid-1990s, employment in logging, sawmills and planer mills, and pulp and paper had declined by more than fifteen thousand.[51] Industry productivity, however, was continuing to grow. From 1979-1992, while employment in BC's interior fell by 17%, harvest volumes actually increased by 18%.[52]

What had become apparent was that the state had relied on the private sector to realize its regional development aims, even though the sole intent of the private sector is to make money. Marchak lashed out at government stating that "it is sheer folly for government to grant them (the companies) huge resources on the premise that they will ever-more sustain

[50] Stauffer, "Resource Development Patterns of the British Columbia Salmon Canning Industry," 2001.
[51] Marchak et al., *Falldown*, 104.
[52] Delcourt and Wilson, "Forest Industry Employment," S23.

workers and dependent towns. This asks of forestry corporations a level of non-market altruism that is totally uncharacteristic of business anywhere in the market economy."[53] The premise that stable log volumes would lead to stable communities also increasingly came under attack. The concept of "community stability" that was a cornerstone of BC forest policy was clearly not leading to community vitality; at best, the most many hinterland communities could hope for was survival. The people living in these rural areas were treated as labour, not participating citizens. They may have had jobs, but they had not received or developed the capacity to build their towns into sustainable communities.

Through the 1980s and 1990s, appurtenancy was being phased out. By 2002, only 11.5% of the British Columbia harvest was subject to appurtenancy.[54] One year later, the Government of British Columbia officially repealed appurtenancy legislation as part of its *Forestry Revitalization Plan.* It was symbolic of how the state's philosophy around forestry had changed over the course of just over fifty years. While Sloan had placed so much emphasis on forestry as a means of community stability, all of the reasons for eliminating appurtenancy were for the benefit of industry and their global competitiveness. As Young and Matthews state, "[p]olicies such as appurtenancy...that anchored the Fordist-Keynesian goals of spatial dispersion and employment stability in resource production are now framed by the government as crippling drags on competitiveness."[55] Policies such as appurtenancy were eliminated to enable industrial flexibility, efficiency, and free flows of timber.[56] The development and growth of the industry had made a focus on community stability no longer a

[53] Marchak et al., *Falldown*, 111 (text in parentheses is my own).
[54] World Trade Organization, Annex B-1, section 3.
[55] Young and Matthews, "Resource Economies and Neoliberal Experimentation," 181.
[56] British Columbia, *Forestry Revitalization Plan*, March 2003.

practical public policy. Similarly, in the United States, "the dominant ethic of industrialization demanded the fullest use of natural resources,"[57] and likewise led to a decline in the application of water appurtenancy.

Is the appurtenancy story one of a good-policy-gone-bad? Is it an idea that may have been practical in the past but not today? Or is it a rare – if not unique[58] – example of provincial legislation specifically designed to foster at least some level of regional economic development? Are its principles still applicable today, to modern understandings of the requirements for regional development? If it was more than simply requiring logs from one area to be processed in that same area, what was appurtenancy trying to achieve? What have been the outcomes? Olivia Choe "would stress that it is appurtenancy's underlying *principles* – the principles of proximity to, and familiarity with, the resource at stake – and not merely the formal doctrinal rules that continue to bear relevance."[59] It is these underlying principles and characteristics of appurtenancy that will be explored in this chapter.

At its core, appurtenancy is based on physical proximity to a resource, but the precise limits of proximity, in geographic terms, are not uniform. Rather, these boundaries have fluctuated relative to the size of the stream and its watershed (in water appurtenancy) or to the size of the mill and the flow of timber needed to sustain it. They have also fluctuated in response to transportation improvements, land and company consolidation, and the growing scale of industrial activity. Nevertheless, proximity to a resource – as opposed to proximity to major

[57] Choe, "Appurtenancy Reconceptualized," 1936-1937.
[58] Bruce Strachan (former MLA and Minster of the Crown, Government of British Co,umbia), in conversation with the author, 15 November 2006. The only other example Mr. Strachan could provide was the Alcan Act of 1951, which has an appurtenancy flavour, in that Alcan was required to construct an aluminum smelter near to where it was generating power.
[59] Choe, "Appurtenancy Reconceptualized," 1915. Italics in original.

population centres or even proximity to markets – has had the effect of decentralizing economic activity, whether this means developing land for agriculture or building mills in peripheral communities. The diagrams below illustrate the concept of forestry appurtenancy, with processing facilities located in each timber supply area (left) and the effects of industry consolidation, improved transportation, and economies of scale (right).

Figure 1.1 – Depictions of Forestry Appurtenancy

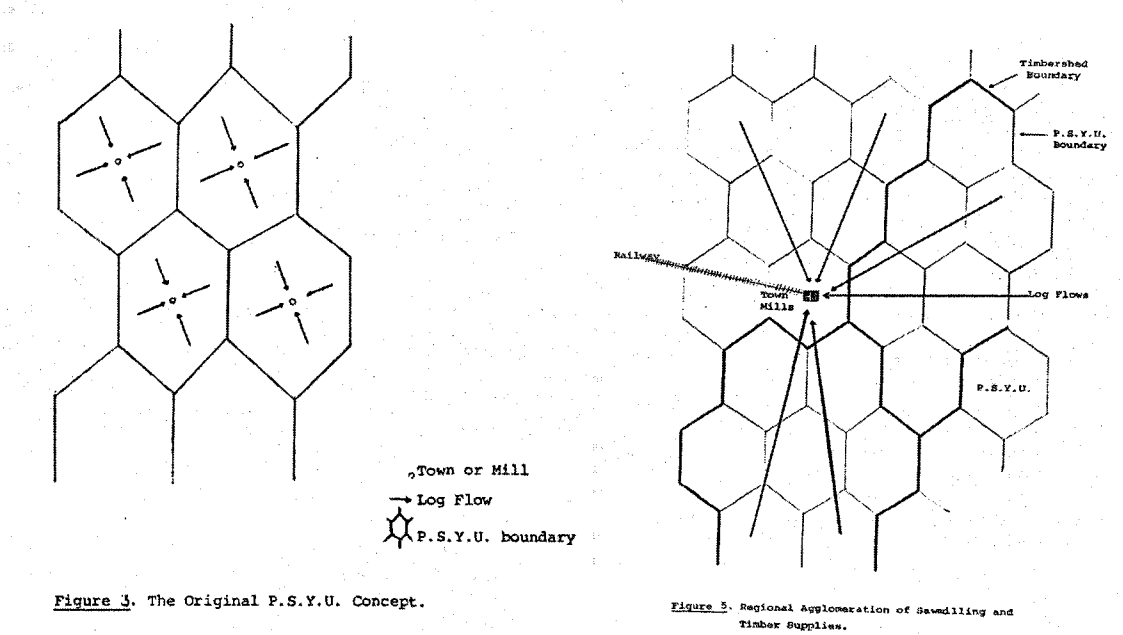

Figure 3. The Original P.S.Y.U. Concept.

Figure 5. Regional Agglomeration of Sawmilling and Timber Supplies.

Source: R.N. Byron, "Community Sustainability and Regional Economic Development," pages 22 and 48. P.S.Y.U. stands for Provincial Sustained Yield Unit, though "Timber Supply Area" is now more commonly used.

The concept of proximity is further explained by Choe. She writes that "[o]nly owners whose property abutted the water had rights to it, and only their adjacent land could benefit. Limiting riparian rights to adjacent owners excluded 'strangers' and thus defined a group of users who could enforce conservationist norms of behavior. Restricting usage to appurtenant parcels demonstrated a reliance on those most familiar with the resource to determine

appropriate levels of usage. In other words, appurtenancy doctrine expressed a commitment to vesting resource management in those closest to, and sharing an interest in, the waterbody. In the eighteenth and nineteenth centuries, this structural commitment coincided with physical proximity."[60]

This statement brings up two other issues: 1) the idea that a resource is best managed by those closest to and familiar with it, and 2) the consideration of property rights and ownership. While Choe makes the point for water appurtenancy regarding the first issue, it does not appear to have been at least an initial intent of appurtenancy in the context of forest policy in British Columbia. While appurtenancy would provide *benefits* to communities adjacent to the resource, it did not include provision for a decentralized form of *management*. This interpretation seems to contradict a recent statement by British Columbia's former Minister of State for Forest Operations. Speaking in 2004, Roger Harris stated that "[i]f governments are serious about the core intent of appurtenancy, rather than have legislative tools that, quite frankly, don't work, we should, in fact, just put the timber under the control of them – communities."[61] Doing so would be to invoke the principle of subsidiarity, a defining feature of federal states. Subsidiarity essentially states that "responsibilities should rest at the lowest level of government capable of providing them,"[62] effectively bringing management of a resource closest to those with a vested interest in ensuring its sustainability. This happened with water appurtenancy in the United States, but not with forestry

[60] Ibid., 1940.
[61] Harris, "Update on Forestry Revitalization" (speech, Forest Expo, Prince George, BC, June 4, 2004).
[62] Tindal and Tindal, *Local Government in Canada*, 224.

appurtenancy. In fact, the historic lack of community control over forest management, even with appurtenancy, has been criticized by academics and forestry commentators.[63]

But why would these authors or the communities themselves feel justified in calling for more community control of natural resources? The answer is part of responding to the second issue raised above pertaining to property rights and ownership. While outright property ownership adjacent to a waterbody is a precondition to accessing water from that same waterbody, the relationship is not so simple in forestry appurtenancy, where there are multiple levels of ownership and perceived beneficiaries. In British Columbia, roughly 95% of forested land is owned by the state (Crown land) and the province has constitutional authority over land and resources. Forest companies that gain tenure over particular areas have the legal right to harvest timber from that land, but they do not gain property rights over the land itself. Thus, "timber is managed and used under highly truncated forms of property rights."[64] Forest companies and the owners of lands that abut waterbodies have *usufruct* property rights, providing them with use and benefits of another's property.[65] Inherent in appurtenancy, then, are benefits without direct ownership or jurisdiction.

The owners, however, also receive benefits. In the forestry context, appurtenancy had been seen to bring benefits related to employment and investment to "the province's hinterland,"[66] "rural regions,"[67] the "northern part of the province,"[68] and "local economies."[69] But

[63] For examples, see M'Gonigle, Parfitt, Bowles, Drushka, and Marchak.
[64] Pearse, "Economic Instruments for Promoting Sustainable Forestry," 29.
[65] Haley and Luckert, "Tenures as Economic Instruments," 129.
[66] M'Gonigle, "Structural Instruments and Sustainable Forests," 105.
[67] Marchak et al., *Falldown*, 18.
[68] Jackson and Curry, "Regional Development and Land Use Planning in Rural British Columbia," 440.
[69] Bowles et al., "The Weakest Link," 22.

Marchak, M'Gonigle, and Parfitt are among those who also recognize that "appurtenancy was a key aspect of industrial development in the province."[70] While appurtenancy was intended to assist in regional economic growth, the ultimate objective was to enhance the economic development of the entire province. Its emergence as an integral component of British Columbia forest policy coincided with an active period of industrial development, largely encouraged by the Social Credit party and Premier, W.A.C. Bennett. The decades following the end of World War II have been described as an era of active "province-building"[71] in Canada, with Bennett and his government focused strongly on "opening up" British Columbia's northern region. Shortly after the Social Credit election win in 1953, Bennett declared his government's intentions: "If there is any one thing of basic importance to the further development of British Columbia, it is the development of the rich resources of the northern and central interior regions of the province."[72] In addition to the economic goals, province-building was an exercise in political power and jurisdiction,[73] reportedly preparing the province both for possible expansion into the Yukon while defending against incursions from Alberta.[74] Appurtenancy, therefore, was not simply about strengthening communities in places such as Houston, Quesnel, or Fort St. John; it was akin to border security. Together with the government's massive investment in transportation infrastructure, policies such as appurtenancy were intended to develop the province beyond Vancouver: This sentiment was expressed by former MLA Phil Gagliardi in a book about Premier W.A.C. Bennett. He said that "[w]hen we became government, the province of British Columbia stopped at the

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[70] Parfitt, *Getting More from our Forests*, 9.
[71] Black and Cairns, "A Different Perspective on Canadian Federalism," 27-44; Tomblin, "W.A.C. Bennett and Province Building in British Columbia," 45-61; and Wedley, "Infrastructure and Resources," 1986.
[72] Mitchell, *W.A.C. Bennett and the Rise of British Columbia*, 209.
[73] Tomblin, "W.A.C. Bennett and Province Building in British Columbia," 60.
[74] Wedley, "Infrastructure and Resources," 446.

Pattullo Bridge; the city of Vancouver had the parochial idea that they were the sum total of everything. Jumping Jehoshaphat, we made the province of British Columbia!"[75]

Beyond its economic development objectives, appurtenancy established rules around resource use. These rules were not always effective. In the United States, increasing demands for water and industrialization during the latter half of the 20th century exposed appurtenancy's weaknesses related to conservation and efficiency, and for reallocating resources to those in need during times of scarcity.[76] Competition for water, for example, has led to land acquisitions that are incidental relative to the acquisition of water rights. Known as "water ranching" in the United States, the practice has also been common in Australia.[77] In Latin America, rigid appurtenancy regulations have prevented access to water by non-land owners, effectively stagnating regional development.[78] It would appear that appurtenancy works best when the resource is plentiful.

Similarly, in British Columbia, appurtenancy worked well when the province was perceived to have an endless supply of trees, and demand for forest products was high. But already by the 1970s, employment was declining relative to productivity, more efficient mills were looking further afield for their timber, and the domestic forest industry was being challenged by competitors in other countries with cheaper labour costs and more relaxed environmental regulations. Or, companies realized that the value of timber was greater than their investment in local infrastructure. For example, in what could be described as "timber ranching,"

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[75] Phil Gaglardi, quoted in Mitchell, *W.A.C. Bennett and the Rise of British Columbia*, 261
[76] Choe, "Appurtenancy Reconceptualized," 1911-1912.
[77] Lee and Jouravlev, *Prices Property and Markets in Water Allocation*, 72.
[78] Ibid., 73.

appurtenancy requirements were relaxed for tenure holders in Youbou and Hazelton, allowing them to close their mills while still retaining the rights to harvest and sell timber.[79]

Appurtenancy was increasingly being seen as an impediment to corporate efficiency and industrial economies of scale that were seen to be vital for global competitiveness. Speaking in 2003, forest products economist Don Roberts called on the provincial government to eliminate appurtenancy on the grounds that it bred inefficiency. "When there's oversupply ... a company ends up running a single shift at three mills instead of closing two and running full shifts at the third. It loses money, goes out of business, and the mills close anyway."[80] It was happening. Despite appurtenancy's intentions, the province had seen thirty mills close while appurtenancy legislation existed.[81] When the provincial government eliminated appurtenancy legislation in 2003, it acknowledged that the policy had had unintended consequences that limited the forest industry's ability to "weather the ups and downs of the global marketplace."[82]

Communities had little option but to accept the changes, recognizing that it was better to keep some jobs in a (hopefully now) competitive forest industry than none at all. Appurtenancy, however, had come to mean more than the presence of a local mill that was put there to process timber from the surrounding countryside. Appurtenancy had become highly symbolic of a social contract between the state, big business, the metropole, and the resource-rich hinterland. The Forests Ministry admitted as much when it announced the

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[79] Bennett, "Log Exports Create Jobs," 7 August 2004; Parfitt, *Getting More from our Forests*, 10.
[80] Natural Resources Canada, "The State of Canada's Forests: 2002-2003," website.
[81] Harris, "Update on Forestry Revitalization" (speech, Forest Expo, Prince George, BC, June 4, 2004).
[82] British Columbia, *Forestry Revitalization Plan*, March 2003.

changes to the province's forestry legislation.[83] The Opposition pounced, chastising the government at length in the Legislature for breaking the social contract and selling out the interests of rural communities.[84] The Canadian Centre for Policy Alternatives claimed the move "would terminate the social contract at the heart of BC's rural development."[85] The Union of British Columbia Municipalities expressed its concern over the elimination of appurtenancy and the potential impact on communities.[86] The Coalition for Forest Solutions even proposed a new social contract between urban and rural British Columbia based on a new definition of appurtenancy that would include more local control over the resource base.[87]

Ultimately, these groups were worried about the future of peripheral, resource-based communities because the elimination of appurtenancy was a part of a major change in the state's approach to governance and economic development. Appurtenancy was an integral part of "one of the most thorough Fordist experiments in the capitalist world,"[88] characterized by a high level of government intervention in the operation of the economy. The elimination of appurtenancy was one of the reforms that "represent a significant departure from the Fordist model that has anchored rural and resource development in BC since the Second World War."[89] In the new neoliberal world, government was being seen as an obstacle to

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[83] Ibid.
[84] British Columbia, *Debates of the Legislative Assembly* (8 May 2003), 6624 (Joy McPhail, MLA).
[85] Lee, "BC's Social Contract is being dismantled in revolutionary ways," 1 December 2003.
[86] Union of British Columbia Municpalities, "Forestry and Energy Dominate Committee's Agenda," *Annual Report 2003: Strengthening UBCM Effectiveness*, http://ubcm.ihostez.com/contentengine/launch.asp?ID=892&Action=bypass.
[87] Coalition for Forest Solutions, "A New Social Contract," http://www.forestsolutions.ca/PDF/ANewSocialCojc.pdf.
[88] Young and Matthews, "Resource Communities and Neoliberal Experimentation: The Reform of Industry and Community in Rural British Columbia," 178.
[89] Ibid., 180.

economic expansion. An outcome of this reform, however, has been the empowerment of corporate actors and industry; not peripheral communities and citizens.

Beyond evolving political ideologies, Canadian federalism does not work in favour of the resource-based regions in the northern parts of the provinces. The regions function as colonial hinterlands to the southern heartlands and the provincial relationships work to ensure that there are few east-west links between the regions.[90] Within this political context, social contracts are necessary because they seek to equalize opportunity for citizens who would otherwise have little control over their own future. As Innis described in his staples theory, the economic and political drivers have been primarily exogenous. By means of illustration, Byron suggests that wood supply (an endogenous issue) is rarely a problem that has contributed to the instability of forestry-dependent regions. Rather, it is the myriad of exogenous factors – industry consolidation, new technologies, lumber prices, and fluctuating export levels and demands – that have been the greatest reasons behind declining employment in forestry and community instability.[91] Through appurtenancy, however, it was exactly this industry that the state entrusted with regional development.

There were two major problems with the social contract that appurtenancy represented: first, harvesting a consistent number of trees and processing them in the local mill(s) did not produce stable employment. In fact, since the early 1980s, the number of employees had declined significantly, especially relative to the industry's productivity.[92] Second, and perhaps more importantly, even if employment levels had remained constant, this alone

[90] Coates and Morrison, *The Forgotten North*, 6.
[91] Byron, *Community Sustainability and Regional Economic Development*, 152.
[92] Ibid., 22; M'Gonigle and Parfitt, *Forestopia*, 21; Marchak, *Falldown*, 101-106.

would not have succeeded in fostering citizen equality and community stability. In fact, research on resource communities that have benefited from policies such as appurtenancy illustrates that the scale of the local forest industry may have very little to do with a community's continued existence and vitality.[93] As Lois Dellert suggests, "the unquestioned assumption that timber meant jobs blinded foresters to the inadequacy of harvest regulation as a social and economic policy."[94] Foresters, however, were not the only ones blind to the real needs of communities and regions. As Marchak states, "communities have been treated as suppliers of labour (rather) than as pools of citizens."[95]

Over time, it was supposed to change. The theory of incremental growth[96] predicted that initial investments in resource-extraction would attract industry, which in turn would attract infrastructure and secondary manufacturing and lead to a self-sustaining growth rate.[97] This did not happen everywhere. In fact, often the opposite occurred. In his article on the role of communities in the forest products chain, Paul Bowles argues that appurtenancy provided communities and regions with some security regarding their economic position.[98] That sense of security, however, may have been more curse than blessing, delaying community urgency around the need for diversification. Even though jobs have been declining for a generation, those that exist remain lucrative. Like a gambler waiting for his/her next big win, employees and communities would endure periods of bust in anticipation of the return of boom times, which would inevitably come. Hayter and Barnes call it "the Fordist bargain," where the

[93] Byron, "Community Stability and Forest Policy in British Columbia," 62.
[94] Dellert, "Sustained Yield: Why Has it Failed to Achieve Sustainability?" 270.
[95] Marchak et al., *Falldown*, 15.
[96] Marchak, *Green Gold*, 1.
[97] Byron, "Community Stability and Forest Policy in British Columbia," 62.
[98] Bowles et al., "The Weakest Link," 22.

community traded away control for the prospect of wealth.[99] Walter takes the point further, suggesting that the wealth extracted from forest communities represents "the mining of natural capital, not genuine wealth generation"[100] nor development of human capital. In short, appurtenancy generated employment, but not the capacity required for long-term regional development and diversification.

Already in 1976, Byron stated that "development with stability is more likely to stem from diversification than from forest yield regulation."[101] The capacity for diversification in resource regions has been affected, however, by the growth and attraction of metropolitan centres. In fact, Marchak argues that resource development in British Columbia has actually had the effect of driving educated people (or those seeking an education) out of rural areas, "thus the regions lose the very members of their populations who might have the skills to develop the communities in more diverse directions."[102] High wages in resource industries added a disincentive to education and diversification and led companies to import labour-saving technology. This resulted in exactly what Innis predicted: entrenched staples dependence. The exogenous players pulling the levers of political and economic power were interested in the wealth that would come from *developing the region*, not the vitality and diversification that would result from *regional development*.

[99] Hayter and Barnes, "The Restructuring of British Columbia's Coastal Forest Sector," 184.
[100] Walter, "Staples, Regional Growth, and Community Sustainability," 297.
[101] Byron, *Community Sustainability and Regional Economic Development*, 150.
[102] Marchak, *Green Gold*, 28

Conclusion

In summary, the application of water and forestry appurtenancy has exhibited several intents and outcomes, all of which lead to the following set of principles and characteristics:

- Appurtenancy is based on the concept of geographic proximity to a resource. It, therefore, contributes to the decentralization of economic activities.
- It recognizes that a resource is managed best by those closest to and familiar with it.
- Consistent with usufruct property rights, appurtenancy provides benefits without direct ownership or jurisdiction.
- In addition to providing benefits locally, appurtenancy provides benefits to the state.
- Appurtenancy can restrict access to a resource and be economically inefficient.
- It is symbolic of a state-supported social contract linking all citizens.
- Appurtenancy entrenched staples dependence because it provided benefits without control nor the capacity for diversification.
- As government policy, appurtenancy itself was exogenous. The region did not control its application or elimination.

Appurtenancy's usefulness to regional development was limited in part because of its connection to an industry that was exogenously controlled. Technological changes, industry consolidation, and economies of scale – all promoted to make the forest industry more competitive – were undermining the effectiveness of appurtenancy as a regional development tool. It was also the victim of major changes in what was perceived to be the optimal level of state involvement (or interference) in regional development. Appurtenancy was born and

applied in a time when state intervention was understood to be critical to regional development. This is classic Keynesianism. Today, neoliberal approaches suggest that such state involvement is artificial and unsustainable over the long term. Is appurtenancy still relevant today? Later, this thesis will apply the characteristics and principles of appurtenancy outlined above to modern efforts aimed at fostering a more endogenous human capacity necessary for regional development in a knowledge-based economy.

Chapter Two

Changing Conceptions of Regional Development: From Sawmills to Universities

There is increasing evidence of a shift away from unskilled workers toward skilled workers in virtually all industries. This process has been generally referred to as the ongoing shift from a 'resource-based' economy to a 'knowledge-based' economy.[103]

Over the years, appurtenancy has had its proponents and critics, but it is clear that it was a logical – and even inspired – policy direction during a time when the conditions necessary for regional development (or "community stability" as it was originally described) were perceived to be different than they are today. The previous chapter described changes that were occurring in the British Columbia forest industry that had conspired to make forestry appurtenancy fall out of favour, both in the eyes of policy-makers and the industry itself. Resource-dependent communities and regions, however, saw appurtenancy as an important link between resource extraction and the local/regional economies. This link, however, was weak and appurtenancy was failing to ensure community stability because of larger changes that were occurring related to the nature of the economy and the factors that were becoming necessary for regional development.

This chapter will build on chapter one by illustrating the historic importance of resources (or staples) in growing the economies of Canada's non-metropolitan regions, especially the North. This paper uses a generous definition of the North, along the lines suggested by

[103] Alasia, *Skills, Innovation and Growth*, 19.

Hamelin, Weller, Coates and Morrison, Bone, and Johnston.[104] In Canada, however, the North is not homogeneous. It can be thought of as at least two main regions, roughly divided by the 60th parallel: to the north lies the *Territorial North,* which has primarily been the jurisdiction of the federal government; to the south is the area described as the *Provincial Norths*[105], in which resource extraction has occurred to fuel the growth of provincial metropoles and support province-building initiatives. This paper focuses on the provincial norths, with particular attention on the northern parts of the provinces of British Columbia and Manitoba. In considering regional development, it would be wrong to consider the provincial north as a single entity. Even though it exhibits many similar geographic, economic, environmental, cultural, social, and political characteristics across Canada, the provincial north is divided by the provincial boundaries, creating a series of what Coates and Morrison describe as "internal colonies."[106]

This chapter will include a review of the major trends in the evolution of regional development. Writing about the political economy of northern development in the 1970s, Kenneth Rea draws a clear distinction between economic *growth* and economic *development.* While economic growth can be measured simply by tracking an increase in the quantity and value of goods and services produced in a region, economic development describes "a change in economic structure, primarily away from reliance on extractive activities."[107] The over-arching trend in the literature has focused on a shift from a resource-based to a

[104] For descriptions of these northern regions, see Coates and Morrison, *The Forgotten North*, 11-17; Bone, *The Geography of the Canadian North*, 4; and Johnston, "The Provincial Norths and Geographic Study," 2-4.
[105] Coates and Morrison, *The Forgotten North*, 1-6.
[106] Ibid., 6.
[107] Rea, *The Political Economy of Northern Development*, 25.

knowledge-based economy. It is this shift that has been described as a "crossroads"[108] in regional development, provided the opportunity to consider elements of exogenous and endogenous development, challenged policy-makers and northern regions alike, and ignited the power of universities to be vital regional institutions.

Regional Development Then...

From 1867 to 1957, Ottawa lacked any comprehensive orientation toward regional development, but the end of World War II signalled the start of an era when differences among provinces and regions were perceived to have "undesirable consequences."[109] A revised fiscal equalization program was introduced in 1957 along with incentives to firms that wished to locate in designated regions.[110] This coincided with the election of Prime Minister John Diefenbaker, whose northern vision led to the *Roads to Resources* program, a cost-sharing arrangement between the federal and provincial governments to help increase the flow of resources to processing plants and foreign markets. But neither Diefenbaker's leadership, his northern vision, nor the Roads to Resources program lasted very long, in part because the primary jurisdiction for developing and selling natural resources belonged with the provinces, who gladly accepted federal funding as long as the agenda was set by the province. This agenda often included a relationship with large, multinational firms that ensured a relatively quick pay-off for the significant public investment in transportation infrastructure.[111] Writing specifically about BC – though there are parallels with other provinces – John Wedley suggests that post-war provincial governments have "relied heavily

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[108] Hutton, *BC at the Crossroads: New Regional Development Pathways for the 21st Century*, 2002.
[109] OECD, *Regional Problems and Policies in Canada*, 18.
[110] Ibid.
[111] Markey et al., "The Struggle to Compete: From Comparative to Competitive Advantage in Northern British Columbia," 19.

on foreign investment and markets to speed and promote maximum development of northern resources."[112]

This theme is also evident in Donald Savoie's description of *The Cargo Cult*. Savoie modeled his version of dependency theory after World War II supply drops in the Pacific Islands: American soldiers built runways in the jungle after which the natives would sit and wait for "the silver bird" to come, bringing everything they needed for survival.[113] Applied to the Canadian experience, government usually played the role of the American soldiers, building infrastructure, passing legislation, and providing investment aimed at preparing the region for economic activity. The silver bird is industry. As Savoie suggests, like the airplane in the Pacific, no one really knows where it comes from and no one really cares.[114] The tangible results are all that matter: jobs, good salaries, and infrastructure, all miraculously available simply by extracting the resources of a particular region. "In the cargo cult magic, the population of the designated region plays a passive role."[115] While the region provides the labour and the resource, the profits and control are located elsewhere. Simply stated, "the motor of economic development is exogenous,"[116] implying that it originates from outside of the region.

The exogenous control of resource exploitation has characterized efforts to grow the economies of the provinces; especially the northern parts of the provinces. In their work on the future prospects of these regions, Polèse and Shearmur confirm that "peripheral regions

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[112] Wedley, *Infrastructure and Resources: Governments and Their Promotion of Northern Development in British Columbia 1945-1975*, 26.
[113] Savoie, *Rethinking Canada's Regional Development Policy*, 19.
[114] Ibid.
[115] Ibid.
[116] Ibid.

have traditionally been settled in order to gain access to resources."[117] Gaining access to these resources was driven by corporate and government interests that were both removed from the region itself. In assessing Canadian theories on regional development, Weaver and Gunton suggest that "there is one dominant theme that can be identified: economic and political power wielded by foreign-owned multinational firms has inhibited Canadian economic development."[118] In the case of staple-producing regions, these firms have directly controlled the flow of resources out of regions and include corporations that are either foreign-owned or largely dependent on foreign markets. In the provincial norths, the primary foreign powers have been the United Kingdom, the United States, and – increasingly – Asia.

It has not necessarily been a bad thing. Provinces have gained incredible wealth through the export of their natural resources and the well-paying jobs that were created attracted thousands of people to northern communities. In fact, Hutton describes the staple extraction sector as "the centrepiece"[119] of British Columbia's economy through the 20th century, and while he was writing specifically about BC, this experience has not been limited to the West. Polèse and Shearmur agree that "the economies of most peripheral regions in Quebec and Atlantic Canada continue to be highly dependent on resource-based industries,"[120] especially fishing and forestry. Appurtenancy was part of this history of using resource-extraction to create regional and provincial economies. It did not, however, make the levers of control any less exogenous.

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[117] Polèse and Shearmur, "How Can we Halt the Demise of Canada's Peripheral Regions," 48.
[118] Weaver and Gunton, "From Drought Assistance to Megaprojects," 208.
[119] Hutton, *BC at the Crossroads*, 3.
[120] Polèse and Shearmur, *The Periphery in the Knowledge Economy*, 88.

Today, the resource economy is no longer the centrepiece of regional development efforts. There are a number of reasons for this. First, many stocks of natural resources have been depleted or are more strongly controlled through government regulation.[121] Examples include the overfishing of wild stocks and the restricted access to timber brought about by regulation and the increased number of protected areas. The end result is that maintaining historic employment levels through increasing resource extraction is no longer possible "because the capacity of the natural environment to continue providing these resources is being approached or met."[122]

Second, there is increased global competition leading to uncertain export markets and prices.[123] This can lead to wildly fluctuating prices for all resource products and examples can be found in mining communities such as Tumbler Ridge, Cassiar, and Thompson, where whole communities can feel as if they are being held hostage to global mineral prices. The problem for resource communities in Canada is that it is often cheaper and easier to exploit resources in developing countries.

Third, globalization has also led to ownership consolidation, recently seen in the nickel industry, when Canada's Inco was purchased by Brazil-based Companhia Vale do Rio Doce (CVRD)[124] and re-named Vale Inco. Generally, the result of ownership consolidation is fewer jobs that are more centralized in fewer locations. As Markey *et al.* state, this

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[121] Hutton, *BC at the Crossroads*, 3
[122] Reed, "Local Politics in the Provincial Norths," 226.
[123] See Hutton, *BC at the Crossroads*, 13; and Gunton, "Natural Resources and Regional Development," 71.
[124] Companhia Vale do Rio Doce, "CVRD holds 86.57% of Inco," *Press Office*, November 6, 2006, http://www.cvrd.com.br/saladeimprensa/en/releases/release.asp?id=16736.

restructuring at the corporate level has "placed pressure on both the profitability of the resource sector and the population base of these communities."[125]

Fourth, improved technology in resource industries has allowed productivity to increase, even while employment levels have dropped. Although this has only recently happened in the manufacturing industry,[126] it has been present in resource industries for more than a generation[127] and is a continuing trend.[128]

Finally, it would seem that policy-makers and Canadians alike (the majority of whom live in large urban centres) are no longer interested in fundamental issues related to resource management and peripheral communities. The power of metropolitan media and metropolitan voters was rarely more obvious than during December 2006 and January 2007 when provincial and federal politicians were "guilted"[129] into contributing millions of dollars to restore Vancouver's Stanley Park after about ten thousand trees were blown over during severe windstorms. Even though hundreds of millions of trees had been killed in the British Columbia interior by the mountain pine beetle, the restoration of Stanley Park seemed to capture the greater interest of voters and the provincial media, with the major television station even hosting a week-long telethon to support the park.[130]

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[125] Markey et al., "The Struggle to Compete," 19.
[126] *The Globe and Mail*, "Old Economy v. New Economy: How production and jobs are changing," April 27, 2006, B8.
[127] Alasia, *Skills, Innovation and Growth,* 8.
[128] Polèse and Shearmur, *The Periphery in the Knowledge Economy*, 88.
[129] Brian Coxford (reporter, Global Television, British Columbia) in conversation with the author, June 2007.
[130] The primary public fundraising effort for Stanley Park was a telethon that aired during the Global Television "News Hour" from January 8-12, 2007.

Given these realities, what is an appropriate response for resource-based regions? Increasing resource rents,[131] creating a trust fund with the proceeds from resource extraction,[132] and even encouraging people to leave hinterland communities[133] have all been suggested. The changing nature of the economy is leading to a reconsideration of what is required for regional development.

...And Now

A 2005 Statistics Canada review of the prospects for rural and territorial development in Canada determined that natural resources had reached their capacity as economic engines and that knowledge is the new factor that "propels economic growth."[134] After centuries of relying on resource extraction as the basis for economic growth, especially outside of metropolitan centres, the statement is indicative of a major shift in understanding about regional development. This change has accompanied the emergence of the knowledge-based economy.

The Organization for Economic Cooperation and Development (OECD) defines the knowledge-based economy as those economies that are "directly based on the production, distribution, and use of knowledge and information."[135] It is also a term used to recognize that the growth rates of developed countries can no longer be measured only in terms of

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[131] Gunton, "Natural Resources and Regional Development," 2003.
[132] Pretes and Robinson, *Beyond Boom and Bust: A Strategy for Creating Sustainable Development in the North*, 1988.
[133] Ibbotson, "A bleak choice for Young Indians," *The Globe and Mail*, August 3, 2006.
[134] Alasia, *Skills, Innovation and Growth: Key Issues for Rural and Territorial Development*, 24.
[135] OECD, *The Knowledge-Based Economy*, 7.

traditional economic factors such as land, labour, and capital.[136] It is beyond the scope of this chapter to outline the historical evolution of the knowledge-based economy other than to point out that it has grown concurrently with a decline in the perceived importance of the resource-based economy. In fact, the very definition of economic development today implies a shift from resource-based, rural, low-skilled activities to knowledge-based, urban, specialized activities that rely on a highly educated, highly skilled, and creative workforce.[137]

This definition would seem to penalize non-metropolitan regions from the start, but it would also seem justified by a number of facts. First, the 20th century has been marked by a major transition in employment from primary (resource extraction) to secondary (manufacturing) and tertiary (services) sectors. This has been a challenge for non-metropolitan areas because their labour forces have typically been focused on production and resource extraction.[138] The smaller populations of non-metropolitan regions have also meant that their tertiary sector opportunities have been limited to "low-order" service jobs in retail and food. The "high-order" jobs in finance, technological development, research and development, higher education, entertainment, art and design, communications, etc. – the very sectors that drive the growth of the knowledge-based economy – are primarily based in metropolitan centres.[139] This in turn leads to the consolidation of even more high-order services in cities. These include a variety of private sector enterprises as well as government services in such areas as education and health.[140]

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[136] Cooke and Leydesdorff, "Regional Development in the Knowledge-Based Economy," 7
[137] Alasia, *Skills, Innovation, and Growth*, 32.
[138] Tykkylainen, "The Knowledge Economy in a Core-Periphery System," 12.
[139] Polèse and Shearmur, "How Can We Halt the Demise of Canada's Peripheral Regions?" 49.
[140] Hanlon and Halseth, "The Greying of Resource Communities in Northern British Columbia," 2005.

Second, the consolidation of services in big cities is part of a vicious cycle that leads to demographic change. In non-metropolitan areas, services are often reduced because of small populations, but losing them makes the community even less attractive to current and/or future residents, potentially leading to population decline, especially among young, non-aboriginal residents. Long-dominated by young families, many resource-based communities are now struggling to cope with relatively large numbers of older residents for the first time in their histories.[141] Limited employment opportunities in the resource industries (together with limited local services, such as higher education) have encouraged the departure of younger citizens. As a result, most regions of northern BC, for example, have recently "experienced faster growth in the population aged 65 to 79 than did the rest of the province."[142] Most regions of northern BC have also seen a more rapid rise in the average age of residents. Between 1996 and 2006, the median age of BC residents increased 12%. Over the same period of time, the average age of residents in Prince George increased by more than 18%; it rose by nearly 23% in Terrace; and Quesnel's average age increased by 29%. The only region in northern BC that saw its average age increase at a rate lower than the BC average was the Peace River region, which was experiencing a boom in oil and gas exploration.[143]

Third, and connected with the aging populations in northern communities, the so-called "brain drain" is affecting the ability of non-metropolitan regions to participate in the knowledge-based economy. Young people are often forced to leave northern regions to

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[141] Ibid, 4.
[142] Ibid., 5.
[143] The average age of residents was obtained by comparing data from Statistics Canada's 1996 and 2006 Community Profiles for the cities indicated in the text.

pursue higher education and the consolidation of "high-order" tertiary sector employment opportunities in metropolitan centres means they will have a greater likelihood of applying their education in the cities where they pursue their education. As a result, there is a persistent,[144] and possibly widening,[145] gap in university attainment between Canada's urban and rural areas, and the feared out-migration of youth from rural to urban areas "suggests that rural localities have, for most of this century, subsidised urban economic growth."[146] In other words, the phenomenon is not a new one. Nevertheless, it persists and hampers the ability of non-metropolitan regions to participate in a changing economy. Not only do young people often leave to pursue educational opportunities, those who do possess university credentials are the most mobile and most likely to leave peripheral communities. Why does this matter? It matters because university-level educational attainment is the most common indicator of a region's human capital[147] and retaining it "is the real heartbeat of leading-edge, new rural economies."[148]

Fourth, the low level of human capital has been a major factor behind the challenges non-metropolitan regions have faced in diversifying their economies away from a reliance on resource extraction. Metropolitan centres have head offices, greater access to a variety of resource inputs, research and development expertise, other "high-order" tertiary services, and larger potential markets. All of these – along with government regulations that serve to perpetuate resource commodity production – have conspired against peripheral regions in

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[144] Alasia, *Skills, Innovation and Growth*, 32.
[145] Tykkylainen, "The Knowledge Economy in a Core-Periphery System," 21.
[146] Alasia, *Skills, Innovation and Growth*, 51.
[147] Ibid., 10.
[148] Azmier and Lozanski, *Fighting the Odds: Rural Development Strategies for Western Canada*, 9.

their efforts to convert their raw materials into end-products. As a result, the relative specialization of resource-based communities has changed little since the 1970s.[149]

The disparities between metropolitan and non-metropolitan regions are not just economic and social; they are also cultural. The residents of metropolitan centres are increasingly disengaged with the needs and issues of peripheral regions,[150] both because resource industries are no longer believed to be important to provincial and national economies[151] and because they are seen to be damaging to the natural environment.[152] For this reason, governments are pressured to institute policies and regulations that restrict resource development,[153] further eroding the economic capacity of resource-based, peripheral regions. One example from BC is the creation of large parks protected areas that disproportionately targets the North in an attempt to meet provincial targets.[154]

These five major trends highlighting the division between metropolitan centres and northern/peripheral communities can be encapsulated in one final statistic: for the first time since the industrialization of northern regions, they have witnessed a sustained period of population decline and this has occurred at the same time that the populations of metropolitan centres have been growing. In essence, metropolitan centres are becoming more attractive and most other parts of Canada are becoming less so. Although there are some exceptions to this general trend (the most notable being oil and gas-producing regions in northeastern British Columbia and northern Alberta), the declines in population relative to metropolitan

[149] Polèse and Shearmur, "How Can We Halt the Demise of Canada's Peripheral Regions," 51.
[150] See Baxter et al., Regions and Resources, 5; McAllister, "Prospects for the Mineral Industry," 2.
[151] Business Council of British Columbia, "BC's Prosperity Is Still Closely Tied to the Resource Sector," 4-5.
[152] McAllister, "Prospects for the Mineral Industry," 18.
[153] Jackson and Curry, "Regional Development and Land Use Planning in British Columbia," 440-441.
[154] Halseth et al., "Regional Economic Shifts in British Columbia," 321.

centres "reduces the political clout of the peripheral community,"[155] making it even more difficult to retain the industries, services, and jobs that it still has. "This dynamic appears irreversible."[156]

These trends have not been unique to Canada. Indeed, they are a "common story found in the staples-dependent regions of developed countries,"[157] such as the United States and Europe. The widespread nature of this growing gap between metropolitan centres and peripheral regions has attracted attention from academics in an attempt to describe what has been happening and develop new ways of understanding regional development. Some of these are presented in the following paragraphs.

In British Columbia, Markey *et al.*, as well as Hutton, have described the importance of making the transition from *comparative* to *competitive* advantage. In their analyses, comparative advantage refers to the production of goods or services in which the regions have the greatest cost or efficiency advantage over others.[158] This scenario describes the past and present nature of much of the British Columbia economy, where natural resource endowments (trees, coal, minerals, fish, oil and gas, etc.) have been the foundation of the economy. The same is seen in other provinces, especially their northern regions. Competitive advantage, however, embodies a "more robust and dynamic appreciation of the full range of regional resources,"[159] which include natural resources as well as infrastructure and human capital. The components of competitiveness can be complex and range from government

[155] Baldacchino, "Small Islands versus Big Cities," 91.
[156] Ibid.
[157] Markey et al., "The Struggle to Compete," 23.
[158] Ibid., 22.
[159] Hutton, "British Columbia at the Crossroads," 3.

actions in the form of tax incentives and grants, to the presence of institutions that support innovation.

In Europe, Cooke and Leydesdorff go one step further, moving from comparative and competitive advantage to the idea of *constructed* advantage. It is described as a "strategic policy perspective"[160] in which businesses, associations, educational institutions, and governments make specific decisions related to strengthening business networks, local governance, knowledge infrastructure, research funding, and the creativity/amenities/sustainability of communities.[161] The point, according to Cooke and Leydesdorff, is to provide regional economies with creative, technical, and scientific knowledge to "a greater extent than ever before."[162]

Cooke was also an early proponent of Regional Innovation Systems (RIS) in the 1990s after most of the attention in the 1980s was on National Systems of Innovation (NSI).[163] The NSI concept emerged during the early 1980s to describe Japan's recovery after World War II but RISs were thought be more useful for large countries, such as Canada and the Nordic countries.[164] After all, in these locations, national-level theories would "ignore or underestimate geographical differences"[165] and local/regional characteristics. An RIS "consists of a set of interacting public and private firms, institutions, and other organizations functioning according to organizational and institutional arrangements and relationships

[160] Cooke and Leydesdorff, "Regional Development in the Knowledge-Based Economy," 10.
[161] Ibid.
[162] Ibid., 11.
[163] Cooke, "Regional Innovations Systems, Clusters, and the Knowledge Economy," 949-952.
[164] Nilsson et al., "The Role of Universities in Regional Innovation Systems," 10.
[165] Tykkylainen and Neil, "Socio-Economic Restructuring in Resource Communities," 31.

conducive to the generation, use, and dissemination of knowledge."[166] Key components in an effective Regional Innovation System are regional governance, the use of innovation through the commercialization of new knowledge, a network of linkages between economic and political actors, institutional capacity for learning, and both formal and informal interaction between innovators.[167] It is this last point that Statistics Canada highlights in its report on the importance of skills and innovation to rural development. Geographic proximity was cited as a "most relevant dimension,"[168] but it is proximity between actors involved in the innovation process that is now seen to be vital, not proximity to markets and producers that is essential to competitive advantage, nor proximity to resources, which is key to comparative advantage and was the foundation of appurtenancy.

Concurrent with the emerging conception of the Regional Innovation System, Danish scholar Bengt-Åke Lundvall proposed the idea of the Learning Region. Lundvall argued that the knowledge required for modern regional economic development takes the form of know-how and competencies, as opposed to "information" that can easily be transferred to others through communications technology.[169] Lundvall, who was deputy director of the OECD's division on science, technology, and industry during the early 1990s,[170] believed that if knowledge was now a vitally important resource, learning was the most important process. This is because the acquisition of knowledge is not a static thing. More important for Lundvall than simply having knowledge, was the ability to "rapidly acquire new

[166] Doloreux, "Regional Innovation Systems in the Periphery," 70.
[167] Cooke, "Regional Innovations Systems, Clusters, and the Knowledge Economy," 953-954.
[168] Alasia, *Skills, Innovation and Growth: Key Issues for Rural and Territorial Development*, 40.
[169] Lundvall, "The University in the Learning Economy," 2.
[170] Godin, "The Knowledge-Based Economy: Conceptual Framework or Buzzword?" 18.

competencies"[171] as people, communities, and regions were challenged by new problems and new opportunities.

The four conceptual frameworks described above all focus on the importance of people to regional development. According to Lundvall, "what is at stake is the capacity of people, organizations, networks, and regions to learn."[172] Contrast this statement with the following description of why resource communities were initially established:

> Resource communities are settlements or social entities in which a living is made in the industrial and/or service sector by extracting, processing, or supplying natural resources or their non-material values for the benefit of the global system of production and consumption.[173]

The key difference would appear to be a shift in attention from resources to people and from exogenous to endogenous factors in regional development. The exogenous factors have already been described and include the power of foreign companies, leakage from the region of profits and tax payments, and the lack of local or regional political jurisdiction over resource management and tools for regional development. Endogenous factors are those that originate and grow from within the region itself. These include human capital, innovation, and local networks. *Endogenous Growth Theory*, for example, recognizes that people provide more than labour to the economic system and that it is the interplay between knowledge and the structural characteristics of the economy and society that result in economic growth.[174] With their global connections, amenities, economies of scale, networks of mobility, attractiveness to domestic migrants and international immigrants, and sophisticated knowledge infrastructure, metropolitan centres have made this transition. The communities

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[171] Lundvall, "The University in the Learning Economy," 4.
[172] Lundvall, "Why the New Economy is a Learning Economy," 3.
[173] Tykkylainen and Neil, "Socio-economic Restructuring in Resource Communities," 32.
[174] Aghion and Howitt, *Endogenous Growth Theory*, 1-3.

and regions of the resource-based periphery, however, have been generally unsuccessful, in part because of their resource-dependent history, small and widely distributed populations, shortage of knowledge-producing institutions, and their geographic distance from the actors and institutions located in metropolitan centres.[175] Do these regions have a future? If so, what can be done to assist them?

In their critique of Canada's regional development history, Weaver and Gunton propose that greater local control and endogenous capacity for growth are necessary if regions traditionally dependent on resource extraction are to begin closing the gap between themselves and metropolitan centres. They write that "[u]nless regions regain control of their basic economic institutions, the rich will become richer and the poor even poorer."[176] What are these "basic economic institutions" for regional development in the 21st Century? While there is no single answer, the university is certainly one of them.[177]

Universities and Regional Development

The OECD is so interested in the contributions that universities make to regional development that it commissioned a two-year study[178] on the topic that involved fourteen regions in a dozen countries. The majority of the participants were from Europe, but Canada (Newfoundland) also participated. The study follows more than a decade of work by the

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[175] Cortright, *New Growth Theory, Technology and Learning*, ii.
[176] Weaver and Gunton, "From Drought Assistance to Megaprojects," 208.
[177] For examples, see Arbo and Benneworth, "Understanding the Regional Contributions of Higher Education Institutions," 9; Keane and Allison, "The Intersection of the Learning Region and Local and Regional Economic Development: Analysing the Role of Higher Education," 896-902; Goddard, "The Engagement of Higher Educational Institutions in Regional Development," (presentation, OECD/IMHE international conference, Valencia, Spain, 19-21 September, 2007); and Thanki, "How Do We Know the Value of Higher Education to Regional Development?" 84-89.
[178] OECD, "Higher Education Institutions and Regions," *Directorate for Education*, http://www.oecd.org/document/16/0,2340,en_2649_35961291_34406608_1_1_1_1,00.html.

OECD to engage with academics in assessing the causal relationship between universities and regional development. They found that universities make "a significant regional economic, social, and cultural development" and that "this role is growing in importance."[179]

The connection between universities and regional policy is a relatively new phenomenon. In the aftermath of World War II, when efforts to overcome regional disparities became entrenched in government policy, the focus was on physical infrastructure, not knowledge infrastructure. In fact, Arbo and Benneworth argue that "higher education had no place in the regional policy that took shape in the 1950s."[180] Throughout the Circumpolar world, however, peripheral regions were starting to acquire universities by the mid-1950s, first in Russia and Finland.[181] These new universities, and the ones that followed, were the result of intentional government action aimed at rectifying regional inequalities,[182] more than as institutions that would foster regional competitiveness. In this way, they mirror the application of appurtenancy to resource-based communities in British Columbia as examples of Keynesian economics, where government played an active role in stimulating economic development. Occasionally, these universities were created to be institutions of development, but they were always intended first to be regional university access points.[183] In those days, universities were providers of advanced degrees in arts, sciences, and professional programs to meet labour market needs for skilled workers; leaders of research activity; and repositories

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[179] OECD, "Project on Supporting the Contribution of Higher Education Institutions to Regional Development," *Directorate for Education*, http://www.oecd.org/document/48/0,3343,en_2649_35961291_39872432_1_1_1_1,00.html.
[180] Arbo and Benneworth, "Understanding the Regional Contribution of Higher Education Institutions: A Literature Review," 10.
[181] Weller, "Universities in the Circumpolar North," 9.
[182] Arbo and Benneworth, "Understanding the Regional Contribution of Higher Education Institutions: A Literature Review," 10.
[183] Weller, "Universities in the Circumpolar North," 7.

of local and global information that would otherwise not be accessible. Universities had secure funding, a predictable population of students in the 18-24 year age range, and the infrastructure necessary to support research and scholarship that was conducted by individuals working on their own initiative.

The core business of universities is to conduct research and to provide education leading to baccalaureate and graduate degrees. According to the OECD, however, there is now "a 'third-role' for universities not only sitting alongside, but integrated with, mainstream teaching and research."[184] This third role relates to regional engagement and has followed the formation of new conceptions of regional development that highlight knowledge, learning, human capital, and innovation driven by research and development. While this connection between universities and regional development has fuelled recent research, it is not entirely new. As early as 1862 and 1890, the United States government passed the Morrill Acts to expand public access to higher education. The result was the Land Grant College and University system, which provided education in "agriculture, military tactics, and the mechanic arts…so that members of the working classes could obtain a liberal, practical education."[185] It served to expand the system of higher education beyond universities such as Harvard and Yale, which were primarily for the elite members of society. The original Morrill Act allowed for the transfer of federal land to a state on the condition that the state established a public university or college. While the land-grant institutions were highly successful in expanding the spatial distribution of higher education institutions throughout

[184] OECD, *The Response of Higher Education Institutions to Regional Needs*, 10.
[185] National Association of State Universities and Land-Grant Colleges, "The Land-Grant Tradition," http://www.nasulgc.org/publications/Land_Grant/Land_Grant_Main.htm (accessed April 10, 2007; site no longer accessible).

the United States, their primary purpose was to support the economic and industrial expansion that was already underway. According to Laidler, in his book about the role of Canadian universities in the knowledge economy, the land-grant universities started a trend toward regional responsiveness but "what is new about modern universities....[is] the sheer scale of their activities as both creators and purveyors of knowledge of all kinds."[186]

By the end of the 20th century, the aim of the land-grant universities had been fulfilled; namely, that higher education was truly accessible to the masses. This has been one of the great social revolutions of the period following World War II. But other changes have been occurring. There has been a decline in the capacity of resource extraction industries to sustain communities, the environmental movement has grown and succeeded in influencing public opinion in metropolitan centres, there has been a shift from Fordist to post-Fordist manufacturing approaches that increasingly favour specialization over mass-production,[187] and agglomeration, innovative capacity, and human capital are all seen to be vital elements in economic growth and development. For all of these reasons, universities are now regarded as fundamentally important actors in regional development. Indeed, as Arbo and Benneworth state in their OECD report, a new "historic epoch"[188] has arrived.

Most of the literature describing and explaining this new epoch has come from Europe and the United States and it addresses two main issues:[189] 1) the economic impact of universities

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[186] Laidler, *Renovating the Ivory Tower*, 4.
[187] Scott, "Decline or Transformation? The Future of the University in a Knowledge Economy and a Post-Modern Age," 17.
[188] Arbo and Benneworth, "Understanding the Regional Contribution of Higher Education Institutions," 12.
[189] See Thanki, "How Do We Know the Value of Higher Education to Regional Development," 85; Goddard, "Universities and Regional Development: An Overview," 2; and Newlands, "The Role of Universities in Learning Regions," 1.

as measured by the local circulation of salaries and operational/student spending, and 2) their effects on the regional economy by increasing human capital. Of these, the former is place-based and ignores the true potential of universities but is well-documented; the latter is more ambitious and difficult to measure. Those studies that do attempt to measure the regional contribution of universities tend to focus on a limited number of inputs (research funding, average earnings) and outputs (number of degrees awarded, patents, and spin-off companies).[190] But while these measures are consistent, their impact can be exaggerated. Niosi, for example, states that patents and spin-offs "are a modest factor, and probably represent only a small fraction, of the university contribution to economic growth."[191]

In an attempt to fully appreciate the university's contribution to economic growth, broad conceptual frameworks have been developed. Three of them are presented here.

Regional Reciprocity is the outcome of a regional studies research centre at the University of Umea in northern Sweden. Rather than position the university as a one-way provider of economic impacts, human capital, and innovation for the region, Regional Reciprocity suggests the relationship is more one of give and take.[192] Hudson states that a key role played by universities is to connect the local to the global through teaching, research, recruitment of students and employees, and by being members of international networks. The universities gain as well. In the face of changing government policies, uncertain and often distant funding sources, and competition for students, the universities' growing involvement with their

[190] See Goldstein and Renault, "Contributions of Universities to Regional Economic Development," 737-740; and Bercovitz and Feldman, "Entrepreneurial Universities and Technology Transfer," 185.
[191] Niosi, "Success Factors in Canadian Academic Spin-offs," 15.
[192] Hudson, "The University and Regional Reciprocity," 9.

regions is "a new strategy for survival rather than a form of altruistic benevolence"[193] intended to capture political, financial, and moral support.

The growing importance of regionally relevant knowledge-production is at the root of *Mode 2* theory. Presented by Gibbons *et al.* in 1994, it describes how the autonomous, disciplinary, and insular production of knowledge (Mode 1) conducted to satisfy academic inquiry has been superseded by research that is more accountable, applied, and trans-disciplinary (Mode 2).[194] Central to the Mode 2 thesis is simply an increase in the supply of knowledge, fuelled in part by a corresponding increase in the demand for knowledge informed by research and education.[195] From this paradigm, the university – as a vital institution for knowledge-production – was similarly being seen to undergo a change from Mode 1, where it had autonomy and separation from the state and the market, to Mode 2, where it is more geographically distributed, closer to government and the economy, and part of local and regional innovation networks to facilitate the direct application and commercialization of new knowledge.[196] Although the Mode 2 university has its roots in the land-grant institutions in the United States, the linkages between the university, the state, and society grew through to the end of the 20th century, when research funders placed a higher priority on "extracting the maximum economic and competitive benefit from knowledge production."[197]

The strong connections between the university, government, and industry are also presented in the *Triple Helix* model. Developed by Etzkowitz and Leydesdorff in 1997, the Triple Helix

[193] Ibid., 34.
[194] Gibbons et al., *The New Production of Knowledge*, 3-8.
[195] Ibid., 12-13.
[196] Harloe and Perry, "Universities, Localities, and Regional Development: The Emergence of the 'Mode 2' University," 212-217.
[197] Ibid., 214.

model goes beyond simply describing a reciprocal relationship or the importance of applied knowledge to economic growth. The triple helix positions universities, government, and industry as equal partners in a conception of regional development that relies on knowledge and innovation for economic growth.[198] The helix analogy is used to illustrate the close connectivity between the three partners, the degree to which they are becoming intertwined, and the lack of a clear linear relationship. Although it has been normal to conceive of universities, government, and industry as three distinct elements in society, Etzkowitz claims that the increasing power of knowledge and innovation in regional economies is transforming the relationship between the three. "The triple helix denotes the university-industry-government relationship as one of relatively equal, yet interdependent, institutional spheres which overlap and take the role of the other."[199] This model would seem to have limitations in northern or peripheral regions where the major industry players are headquartered outside of the region, regional governmental power is limited or non-existent, and institutions of learning and innovation are usually absent. Clearly, the triple helix model was not developed with northern/peripheral regions in mind.

Instead, the development of the triple helix model grew out of the experiences of successful high-tech conurbations in northern California and along Route 128 in Boston. Etzkowitz believes that while the universities that fuelled these developments – Stanford and MIT, respectively – were once considered anomalies, they have become the places to emulate.[200] Unfortunately, this is simply not possible everywhere. In crafting their triple helix model and

[198] See Etzkowitz et al., "The Future of the University and the University of the Future: Evolution of Ivory Tower to Entrepreneurial Paradigm," 314-315; Etzkowitz, "Innovation: The Endless Transition," 1-2; Etzkowitz, "The Triple Helix of University-Industry-Government: Implications for Policy and Evaluation," 2; and Leydesdorff and Etzkowitz, "The Triple Helix as a Model for Innovation Studies," 196-197.
[199] Etzkowitz, *The Triple Helix of University-Industry-Government: Implications for Policy and Evaluation*, 2.
[200] Etzkowitz et al., "The Future of the University and the University of the Future," 318.

basing it on the experiences in Massachusetts and California, Etzkowitz and Leydesdorff have made a number of assumptions. Beyond simply assuming the presence of a local knowledge infrastructure, they assume that the universities are research-intensive, that government is funding research at a high level, and that industry is engaged in applying the results of the research. In short, the triple helix universities are known for research, not education, and surely not for increasing access to university among a population of students. The model also assumes community/regional sustainability. The complete absence of the local region in the triple helix assumes that the region is not engaged, or that their interests are only represented by governments and industry/business. The development of the knowledge-based economy, however, would seem to indicate that the local region has much at stake.

Writing about regional innovations systems, Cooke stated that "the more knowledge based clusters thrive, the more imbalanced the economy is likely to become spatially and in distributional terms."[201] This imbalance is currently favouring metropolitan centres and large cities that have the advantages of agglomeration around a knowledge infrastructure that includes universities. Indeed, as Alasia states in a Statistics Canada analysis, location is becoming more – not less – important, especially with respect to those in competition with agglomerations. In this competition, he states that peripheral, including northern, regions face particular problems and challenges with respect to their under-investment in education, few regional institutions, small economies of scale, and the high levels of mobility among their

[201] Cooke, "Regional Innovation Systems, Clusters, and the Knowledge Economy," 970.

most skilled/educated residents.[202] This would seem to suggest that state intervention is necessary if there is perceived to be value in sustaining these peripheral communities.

While northern regions relatively far-removed from metropolitan centres have particular challenges, what are the appropriate responses for increasing human capital and diversifying economies? What is the nature of effective university-region interaction and how is it realized in non-metropolitan areas?

Boucher *et al.* studied fourteen regions in seven European countries to specifically gauge the effects of different kinds of universities in different kinds of regions, ranging from technical universities in metropolitan centres to comprehensive universities in peripheral regions. The authors found that among the four categories of universities and regions, there was a great variety in their regional engagement.[203] The older, traditional universities in big cities typically saw themselves as national or global and consequently underperformed in terms of their effects locally and regionally. The comprehensive universities in the peripheral regions, however, scored highest in terms of their effects on regional development. The universities in the peripheral regions were seen to play the greatest proportionate role in their regions' development, to the extent that these regions would be lagging behind the central regions more if the universities did not exist. The case studies used in the analysis showed that these universities "are highly connected to their peripheral regions in terms of knowledge and technology transfer relations. However, there is one key area in which these single player universities in peripheral regions score relatively badly. This area is the extent to which these

[202] Alasia, *Skills, Innovation and Growth*, 29-30.
[203] Boucher et al., "Tiers of Engagement by Universities in Their Region's Development," 889-891.

universities are capable of retaining a substantial part of the graduates for the local labour market. There is evidence of a strong migratory pull of graduates to core regions."[204]

The challenge of graduate retention in peripheral regions is also highlighted in a Finnish study. Up to the mid-1950s, all of Finland's eleven universities and technical institutes were located in southern Finland. Now, there are twenty-one universities, with increased geographic distribution around the country, and participation rates have likewise increased from 5% to 50%.[205] Nevertheless, Helsinki is still a major draw. Comparing the home region of university students in 1980 to where they were living in 1995, the study found that even though peripheral universities drew only between 2.7 – 11.5% of their students from the Helsinki area, the capital attracted between 16.2 – 43.5% of the graduates fifteen years after they attended university.[206] Among the five universities in the study, three retained the most graduates in their home region, while two saw their home region retain even fewer grads than those who left for Helsinki.[207]

These studies illustrate some successes for peripheral universities in terms of regional development, but they indicate limited success in increasing human capital, mainly because of the challenges they face in retaining graduates. Lundvall is among the regional development theorists who argue that the retention of graduates is central to the success of regional universities. For example, while he contends that the triple helix model involves part of the university and part of the community/industry (primarily biotechnology,

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[204] Ibid., 893.
[205] Nilsson et al., *The Role of Universities in Regional Innovation Systems*, 151.
[206] Saarivirta and Consoli, "Regional Development, Education, and Innovation: A Case Study of University Graduates in Finland," 17.
[207] Ibid.

telecommunications, and software development, for example), "the most important link has to do with the recruitment of well-educated graduates."[208] While Lundvall agrees that universities are "crucial assets in a complex and changing world,"[209] the experience from Finland would suggest that the regional distribution of universities is only part of what is needed to enable peripheral regions to compete in an increasingly knowledge-based economy. "The central point is not the allocation of given resources over a geographical space but rather the ability to retain the benefits of new knowledge and thus to employ it both as an output and as an input for the production and circulation of new knowledge."[210] Education *and* research – produced and utilized within the region – are vital to this equation.

A different study of northern universities in Finland (University of Joensuu) and Norway (Tromsø University) suggests that the universities have been "the most successful regional policy measure"[211] in their regions. Although both universities were originally created in the 1960s as part of a welfare state ideology to address regional inequalities, they have come to be seen "as the vanguards of the information and knowledge society."[212] Nevertheless, forty years after their establishment, the universities still experience some constraints with respect to their ability to maximize their contributions to regional development. These include a university profile more focused on professional programs than industrial development, the exogenous nature of their funding (both in terms of operational and research funding), and the fact most of the local industry is still focused on resource extraction and is not heavily

[208] Lundvall, "The University in the Learning Economy," 10.
[209] Ibid., 16.
[210] Saarivirta and Consoli, "Regional Development, Education, and Innovation," 26.
[211] Arbo and Eskelinen, "The Role of Small, Comprehensive Universities in Regional Economic Development," 37.
[212] Ibid., 20.

engaged in research and development.[213] Arbo and Eskelinen do not go so far, however, as to suggest that these limitations constitute a failure. Rather, they highlight the contradictory nature of the expectations placed on universities. For example, they state that universities are supposed to be centres of research and scientific excellence, yet operational funding is primarily determined by student throughput. Similarly, non-metropolitan universities are expected to be engines for regional development, but are faced with little critical mass, limited student recruitment opportunities, and few knowledge-based enterprises that can accommodate graduates.[214]

Another study of nine Nordic universities looks more inward, stating that "the regional impact of a university depends on the character of the university."[215] Nilsson *et al.* suggest that the nature of the University itself will influence where its greatest effects will be felt: in the public sector, existing industry, or a diversified economic base.

Summary

A geographically remote region need not be an economic periphery.[216]

Conceptions of regional development over the past several decades have evolved from the importance of natural resources and transportation infrastructure to human capital and knowledge infrastructure. This has positioned the university as a key institution. Embedded

[213] Ibid., 34-41.
[214] Ibid., 43.
[215] Nilsson et al., *The Role of Universities in Regional Innovation Systems*, 167.
[216] Snickars, "On Cores and Peripheries in the Network Economy," 23.

within a region, it can be the centrepiece of increasingly endogenous attempts to improve and increase the stock of human capital in a region.

Universities cannot do nor be everything. Experiences from the Nordic countries, in particular, point to limits, both in the potential of the university and the capacity of the region to utilize its graduates and both implement and influence its research. But according to David Newlands, "universities have the potential to make an enormous contribution to regional development"[217] and it may now be appropriate to think of their presence as a necessary condition for regional participation in the modern economy. In a different time, appurtenancy was a necessary condition for regional sustainability. During the resource economy, appurtenancy provided the mechanism for ensuring local/regional participation in the economy beyond simply being the source of the resource itself. As the nature of the economy has changed, universities have become the sawmills of the 21st century. Unlike sawmills, however, universities have the capacity to connect with multiple regional actors – reminiscent of the triple helix – in an effort to foster a more endogenous approach to regional development.

This is new for Canada. Much of the research on the effects of northern universities is from elsewhere and according to the Government of Canada's own analysis, "relatively little research has been carried out on the innovation process in smaller communities and non-metropolitan regions."[218] Instead, Canadian literature on regional development has tended to lament the circumstances confronting resource-based, peripheral regions. Solutions, however,

[217] Newlands, "The Role of Universities in Learning Regions," 15.
[218] Alasia, *Skills, Innovation and Growth*, 57.

have largely been absent. The time is right to consider the role of northern universities as a capacity-builder and partner in a regional network of innovators, industry, services providers, and government. If Canada is interested in preserving communities outside of a few metropolitan centres, nothing could be more important than implementing effective policy that provides for the creation and distribution of knowledge that will allow all regions to participate in the modern economy. Like many provinces, British Columbia is at a crossroads[219] in considering its responses to a growing gap between its metropolitan centres and peripheral regions. Writing for the OECD, Arbo and Benneworth go one step further, suggesting that universities *are* a crossroads[220] through which regional and national aspirations can be realized.

[219] Hutton, *British Columbia at the Crossroads*, 2002.
[220] Arbo and Benneworth, "Understanding the Regional Contribution of Higher Education Institutions," 86.

Chapter Three

The Northern Capital and the Hub of the North: Creating Universities in Two Northern Regions

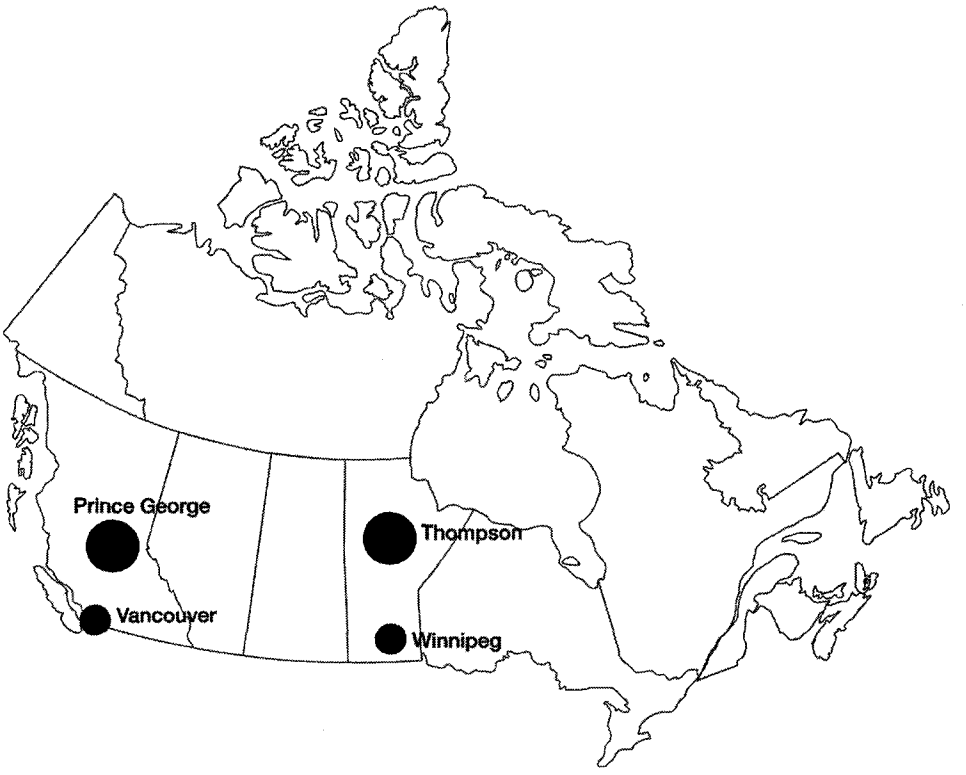
If, as stated at the end of the previous chapter, universities are a crossroads through which regional development aspirations can be realized, many northern regions still lack this vital infrastructure. Those that do have universities have generally not had them for very long. In Canada, the first northern universities were established in Ontario and Quebec during the 1960s, as part of the last major Canadian expansion of universities.[221] In western Canada, however, the creation of northern universities would have to wait some thirty years. The University of Northern British Columbia (UNBC) opened with full operations in 1994 and the University College of the North (UCN) in northern Manitoba first started offering coursework leading to its own degrees in 2005. They are Canada's newest northern universities. This chapter will focus on these two universities and the interplay between them and the regions they inhabit.

UNBC's core campus is in Prince George, a major Canadian forestry centre and the government, retail, service, and transportation centre for northern British Columbia. UCN is officially split between two northern communities in Manitoba – The Pas and Thompson – but its university programming is based at the Thompson campus. Thompson owes its existence to mining and the huge nickel mine established there in the mid-1950s. Both Thompson and Prince George are excellent examples of the resource-dependent nature of the communities throughout the northern parts of the provinces. Both, for example, are on

[221] Weller, "Universities in Northern Canada," 100.

Randall and Ironside's list of resource-dependent communities in Canada and each is the largest community in its province to make the list. [222]

Figure 3.1 – Map of Canada showing the location of Prince George and Thompson in relation to Vancouver and Winnipeg.



BC's Northern Capital

Prince George is the nexus for the most forestry-dependent region in Canada.[223] On any scale, the city and its immediate region produces and distributes an incredible volume of forest products. [224] The Prince George region produces more lumber than either the provinces

[222] Randall and Ironside, "Communities on the Edge: An Economic Geography of Resource-Dependent Communities in Canada,"35.
[223] Stedman et al., "Forest Dependence and Community Well-being in Rural Canada," 216.
[224] A 1996 issue of the Prince George Citizen newspaper reported that "[t]he Central Interior produces 2.9 billion board feet of lumber – enough wood to girdle the globe at the equator two feet wide and one inch thick, plus 900,000 metric tons of pulp and paper, specialty forest products, and 175 million square feet of plywood." Quoted in Rennie and Halseth, "Employment in Prince George," 52.

of Alberta or Ontario,[225] and with most of these products bound for international markets, the region is a major contributor to a national forest economy that – as recently as the mid-1990s – accounted for more export wealth than energy, fisheries, mining, and agriculture combined.[226]

Prince George's proximity to resource wealth is one of two geographical factors behind its growth and development. The other is that it is situated at a natural transportation crossroads.[227] Located at the confluence of the Fraser and Nechako Rivers, the area around the present site of Prince George was an important aboriginal trading route. More recently, it is at the intersection of the North's two major highways, two rail lines, and is home to the region's largest airport. In fact, it was the early development of transportation infrastructure that led to the creation of Prince George as a municipality.[228]

The arrival of the Grand Trunk Pacific railway in 1914 (running east-west) signalled the start of the city of Prince George, which was officially incorporated one year later. The population hovered around the two thousand mark until after World War II when a number of events occurred that shaped Prince George's identity and economy.[229] Forestry was emerging as the major economic driver. By 1950, a boom was underway, with five hundred sawmills in Prince George and the area along the Fraser River to the east.[230] The ability of these sawmills to get their products to market was greatly aided by the arrival of the Pacific Great Eastern

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[225] Council of Forest Industries, "Canada Lumber Production Softwood and Hardwood 1993-2005," *Forestry Industry Statistics*, http://www.cofi.org/library_and_resources/statistics/documents/Canada_lumber_production.pdf.
[226] Stedman et al., "Forest Dependence and Community Well-being in Rural Canada," 215.
[227] Halseth and Halseth, *Prince George: A Social Geography of BC's Northern Capital*, 7.
[228] Stauffer and Halseth, "Population Change in Prince George," 20.
[229] Ibid., 26.
[230] Bernsohn, *Cutting Up the North*, 60.

railway (running north-south) in 1952, which connected Prince George to North Vancouver. It was during this time that Prince George experienced its fastest rate of population growth, averaging an increase of nearly 25% per year.[231] By the 1960s, growth in the forest industry and the construction of three local pulp mills continued to enable Prince George to grow at impressive rates. By the 1970s, population growth had started to slow down and it eventually peaked in the 1990s.[232] More recently, Statistics Canada reports that the Prince George population has actually declined for two consecutive census periods; this has never happened before in Prince George's history. While declining populations have recently been witnessed in other resource-based communities throughout northern BC, such declines are not being experienced in the metropolitan regions of the province. Along with much of northern BC, Prince George has been experiencing what Halseth *et al.* call a period of "restructuring and stagnation" that has characterized much of the region since the 1980s.[233]

Table 3.1 – Recent Prince George Population Trends

	PG	Vancouver	BC
1996 population	75,150	1,831,665	3,724,500
% change in 2001	-3.1%	+8.5%	+4.9%
% change in 2006	-2.1%	+6.5%	+5.3%

Source: Statistics Canada Community Profiles

Despite recent population declines, Prince George had already emerged as the northern region's main service centre, with a regional hospital, government services, arts and cultural venues, and a variety of retail outlets. The northern BC region has nearly 320,000 people,

[231] Stauffer and Halseth, "Population Change in Prince George," 25.
[232] Way, "Recruitment and Retention Challenges of a Regional Centre of a Resource-based Region: The Case Study of Prince George, BC," 30.
[233] Halseth et al., "The Connected North: Findings from the Northern BC Economic Vision and Strategy Project," 3.

about 10% of whom are First Nations. For many northerners, Prince George is closer than Vancouver (786 km south of Prince George), although residents of the northeastern part of the province have stronger ties to Alberta and to Grande Prairie or Edmonton (742 km east of Prince George).

Prince George's emergence as a regional centre has altered its complexion and challenged the stereotypes associated with "typical" resource-based communities. Whether they are described as being resource-reliant,[234] resource-dependent,[235] single-industry towns,[236] or even milltowns,[237] these communities have been the subject of many articles and reports by scholars, news media, and statisticians alike. They are typically portrayed as small, isolated, politically ignored, and dependent on a single industry or employer.[238] Prince George is not particularly small and it has a diverse labour force. For example, while a listing of top employers by the City's economic development arm lists Canfor at number one with 3056 employees,[239] Statistics Canada depicts a labour force divided among a number of sectors:

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[234] Natural Resources Canada, "Resource-reliant Communities, 2001," *The Atlas of Canada*, http://atlas.nrcan.gc.ca/site/english/maps/economic/rdc2001.
[235] Randall and Ironside, "Communities on the Edge: An Economic Geography of Resource-Dependent Communities in Canada," 17.
[236] Bowles, "Single-Industry Resource Communities," 63.
[237] Lucas, *Minetown, Milltown, Railtown*, 1971.
[238] Way, "Recruitment and Retention Challenges of a Regional Centre of a Resource-based Region: The Case Study of Prince George, BC," 9.
[239] Initiatives Prince George, "Major Employers City of Prince George," http://www.initiativespg.com/ipg/media/downloads/top_25_employers.pdf.

Table 3.2 – 2001 Labour Force Participation in Prince George and British Columbia

Industry Sector	% Prince George	% BC
Resource-based industries & agriculture	6.3%	5.2%
Manufacturing & construction	17.3%	15.5%
Health & education	17.6%	16.8%
Business services	17.1%	19.6%
Other services	21%	21%

Source: Statistics Canada 2001 Community Profiles

Clearly, Prince George is not dependent on a single employer but resources – especially forestry – continue to define the economy and the perception of Prince George. It is difficult to draw conclusions related to Prince George's dependence on forestry because the industry's impact in the community and region extends beyond the numbers of people that it directly employs. It is likely that significant parts of the manufacturing and business services sectors in Prince George are dependent to a large extent with the forest sector. Further illustrating the point, Rennie and Halseth, cite media reports that suggest Prince George's employment is 42% dependent on the forest industry.[240] There are other examples that strengthen the connection between Prince George and forestry: the names of two major shopping malls are Spruceland and Pine Centre; one of the local hockey teams is called the Spruce Kings; the city's mascot is Mr. PG, a tall stick figure depicted as being built from logs; and, of course, the distinctive sulphur smell associated with the local pulp mills, long referred to as "the smell of money." Prince George has honestly earned its reputation as a community strongly connected to the forest industry.

[240] Rennie and Halseth, "Employment in Prince George," 52.

The Hub of the North

What forestry is to Prince George, mining is to Thompson. The city owes its existence to the large nickel mine and refinery built there fifty years ago by the International Nickel Company of Canada. Even the name, Thompson, has a connection to the company: the new townsite was named after John F. Thompson, a long-serving Inco chairman.[241] To further illustrate the community's connection with nickel mining, a 25-foot tall statue called *King Miner* stands in the centre of the city and the annual community festival is called *Nickel Days*. But while the Vale Inco mine is huge to Thompson, it is also of vital importance to the provincial economy. Mining is Manitoba's second-largest primary resource industry[242] and it is mostly centered around Thompson.

Thompson is located 739 kilometres north of Winnipeg, at 55 degrees north latitude. According to the 2006 census, the city has 13,593 people,[243] making it Manitoba's third-largest city after Brandon (39,716) and Winnipeg (671,274). The region around Thompson is boreal, with forests dominated by spruce, pine, aspen, and birch. It is part of the Canadian Shield, which was formed more that 570 million years ago, and this geology is responsible for the fact the region contains much of Canada's nickel deposits.[244]

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[241] Heritage North Museum, "Welcome to Thompson 2005," 51.
[242] Veiga et al., "Mining With Communities," 198.
[243] Statistics Canada, "Community Highlights for Thompson (Census Agglomeration)," *2006 Community Profiles*, http://www12.statcan.ca/english/census06/data/profiles/community/Details/Page.cfm?Lang=E&Geo1=CMA&Code1=640__&Geo2=PR&Code2=46&Data=Count&SearchText=thompson&SearchType=Begins&SearchPR=01&B1=All&Custom=.
[244] Verleun and Mackenzie, *Mining Potential in Northern and Southern Canada: Guidelines for Regional Development Policy*, 174.

After the discovery of nickel in 1956, Inco built the mine, smelter, and refinery, as well as much of the future community's infrastructure, including the water supply. What followed was a construction and population boom: over the next few years, houses, a bank, the hospital and school, and Canada's first indoor shopping mall[245] were all built, coinciding with construction at the mine site itself. By 1961, the mine was fully operational. Only nine years later, Thompson was incorporated as a city, with 20,000 residents.[246]

The $175 million that Inco invested to build the mine, plant, and community infrastructure was – at the time – the largest private capital investment in Manitoba's history.[247] The investment has paid off. To date, more than four billion pounds of finished nickel have been produced from the Thompson mine,[248] making it Vale Inco's second-largest producer after its Sudbury, Ontario, operation. More than fifty kilometres of roads and tunnels up to fifteen hundred metres below the surface provide access to the area's rich nickel wealth. Massive drills and loaders send ten thousand tonnes of earth to the surface every day, eventually ending at the refinery where 330,000 pounds (approximately one hundred fifty tonnes) of pure nickel is extracted and exported to customers around the world. Although the price of nickel has fluctuated wildly over the past several years, the daily output of the Thompson operation has a market value of roughly US$4.4 million on the London Metal Exchange.[249] Over the past five years, the price of nickel has increased substantially; in fact, Inco's

[245] Heritage North Museum, "Welcome to Thompson 2005," 49.
[246] Ibid.
[247] Ibid, 71.
[248] Inco, "The Nickel Growers," Inco promotional brochure, no date.
[249] On August 3, 2007, the London Metal Exchange website was reporting that the official price for a tonne of primary nickel was US$29,400. The LME is the world centre for non-ferrous metal trading. http://www.lme.co.uk/nickel.asp.

earnings in the third quarter of 2006 marked a record in the company's 104-year history.[250] By the following spring, the price of nickel reached an all-time high, at which time the Thompson mine was producing US$8.1 million of nickel every day. This has not, however, translated into employment growth and Thompson's population has been dropping for more than a decade. Just like the forestry experience in British Columbia, the introduction of advanced technology in Thompson's mining industry has enabled productivity to continue to rise, even though employment levels are dropping.

Most of those staying behind enjoy a high standard of living. According to Statistics Canada, the residents of Thompson have the highest median household income in Manitoba. The average Thompson family in 2000 earned $59,602; far higher than the $41,661 that the average Manitoba household took home that same year.[251]

Despite their earning power, families in Thompson are facing at least four realities. First, it is increasingly less likely that its members will be employed at Vale Inco. Since the early 1970s, when Thompson had a population of more than twenty thousand, the number of Inco (and now, Vale Inco) employees in Thompson has dropped from four thousand to fewer than fifteen hundred. Increasingly, new equipment and new technologies are replacing labourers and miners. Second, those who become employed possess higher-level skills and academic qualifications than were required in the past. For example, of the twenty Thompson job vacancies posted on the Inco website in March, 2006, only three did not require post-

[250] Vale Inco, "Inco Reports Record Earnings for Third Quarter 2006," *News Room*, 20 October 2006, http://www.inco.com/newscentre/newsreleases/Default.aspx?posting_id=3888.
[251] Statistics Canada, "Median Household Income, 2000 ($) - All Households," *2001 Community Profile for Thompson (Census Agglomeration)*, http://www12.statcan.ca/english/profil01/CP01/Index.cfm?Lang=E.

secondary qualifications.[252] This is indicative of a general decline of job opportunities for unskilled or less educated workers. It also points to the difficulty northern resource communities experience when recruiting specialized employees, whether these are nurses, teachers, physicians, or electrical engineers. With little post-secondary infrastructure and low post-secondary participation rates, northern communities are generally required to attract these highly educated personnel away from urban centres. As a result, most of the jobs that are left vacant – including those in the resource extraction sector – are those that require higher levels of education.

Third, families in Thompson are more likely to be aboriginal. The local aboriginal population is young and growing. For example, while the overall population of Thompson dropped by just over one thousand people between 1996 and 2001, the number of aboriginal residents actually increased by nine hundred. It is a trend that is unlikely to change anytime soon, largely due to the young age structure of the aboriginal population. It should be noted that while 34% of the overall Thompson population is aboriginal, the First Nations population makes up 45.7% of those under the age of twenty. The young age of the aboriginal population is reinforced by a comparison of median ages in 2001: the Manitoba average was 36.8; Thompson's was 29.7; the aboriginal population within Thompson was 20.3.[253]

Finally, most Thompson residents would rather be somewhere else. A study conducted in the mid-1980s explored the issue of labour turnover in northern Manitoba's mining communities

[252] Inco, "Current Opportunities," *Careers*, http://www.recruitingsite.com/csbsites/IncoCareers/careers.asp.
[253] The population and demographic figures were obtained from both the Statistics Canada 2001 Community Profile for Thompson and the City's figures as presented in the 2001 Aboriginal Population Profile, as presented by Statistics Canada, http://www12.statcan.ca/english/Profil01ab/PlaceSearchForm1.cfm

and found that only 42% of Thompson residents gave the city the top ranking for preferred place of residence.[254] Similar studies have found employment opportunities, and not quality of life, to be the primary draw to resource communities and this would seem to be the case for Thompson. Vale Inco is by far the largest employer, employing nearly half of the entire Thompson working population.[255] Nevertheless, like Prince George, Thompson is aiming to diversify its economy by building its capacity as a regional centre.

Table 3.3 – 2001 Labour Force Participation in Thompson and Manitoba

Industry Sector	% Thompson	% Manitoba
Resource-based industries & agriculture	20%	8.4%
Manufacturing & construction	7%	16.7%
Health & education	22.5%	19.8%
Business services	15.6%	15.2%
Other services	20.4%	20.2%

Source: Statistics Canada 2001 Community Profiles

The effort to strengthen Thompson's role as a regional centre was already evident by the mid-1980s. Gill and Smith assessed the importance of twenty-six different community attributes and found that regional services such as health care and retail were among the highest-rated factors, but still lower than natural attributes such as outdoor recreation.[256] While Gill and Smith highlight the youth of Thompson and its attraction to young families, the availability of education at any level was not among the attributes they assessed.

[254] Gill and Smith, "Residents' Evaluative Structures of Northern Manitoba Mining Communities," 26.
[255] City of Thompson, "Labour Force Participation," http://www.thompson.ca/spps/ahpg.cfm?spgid=41.
[256] Gill and Smith, "Residents' Evaluative Structures of Northern Manitoba Mining Communities," 23.

Prince George and Thompson as Case Studies

While Prince George and Thompson are engaged in different resource sectors, they are similar insofar as that they are resource-based communities that have emerged as regional centres for the northern parts of their respective provinces. In fact, it is their role as regional centres that they are using to define themselves, over and above their reliance on natural resource extraction. One only needs to consider their community slogans. Prince George's slogan has evolved from "The Spruce Capital" to "BC's Northern Capital," and Thompson calls itself the "Hub of the North."

Although their roles as regional centres have been determined in part by geography, their ability to evolve in this fashion requires three things. First, Thompson and Prince George require population stability (and preferably, growth) within their municipal boundaries and their immediate regions to ensure that they can sustain the public and private services that will help to retain their citizens and draw users/consumers from the surrounding areas. This requires gradually moving away from a strong reliance on resource extraction since these operations have proven that they generally require fewer people to maintain their productivity levels. Second, the cities require highly skilled people who will provide services in such areas as health, education, business, and government services, as well as the resource sector itself. The challenges that northern communities face in the recruitment and retention of highly qualified personnel in certain sectors can be seen to have a direct link to the quality of life of the entire community.[257] The communities either need to develop this capacity within their populations or be able to attract it from elsewhere. Third, the continued

[257] Way, "Recruitment and Retention Challenges of a Regional Centre of a Resource-based Region: The Case Study of Prince George, BC," 94-95.

development of Thompson and Prince George requires the local generation and application of research and innovation, consistent with the new requirements of regional development that were outlined in chapter two. This can be applied to help ensure the continued sustainability of the resource sector and to the particular needs and challenges of other economic and social services that were originally attracted to – or placed in – these communities because of their roles as regional centres.

Each of these three requirements illustrates the vital role of universities in regional development and helps to explain the efforts undertaken in Thompson and Prince George to acquire universities. First, universities are significant employers in their own right. The experiences of other Canadian cities indicate that universities are often within the top-five of local employers.[258] Universities are also vital institutions because they produce graduates with the skills and education required to perform many functions in society. Even though Prince George and Thompson are major resource centres, Statistics Canada has determined that they are losing even the high-level, skilled positions within their own resource industries to larger cities.[259] The challenge is the same for other high-level public and private services because Prince George and Thompson simply do not have the levels of university-educated people that are seen in their provincial centres.

[258] In Vancouver and Winnipeg, universities are the third-biggest employer; in Edmonton, the University of Alberta is ranked fourth among employers; in Lethbridge, the University is the second-biggest employer; Lakehead University is the 6th biggest employer in Thunder Bay.
[259] Statistics Canada, *Occupational Patterns Within Industry Groups: A Rural-Urban Comparison*, 11

Table 3.4 – Educational Attainment in 2001: Comparing Prince George and Thompson with Vancouver and Winnipeg

Educational Level: Ages 20-34	Prince George	Vancouver	Thompson	Winnipeg
Less than high school graduation	18.1%	11.6%	26.9%	16.7%
Trades certificate	13.2%	8.8%	12.6%	9.8%
College diploma	16.1%	17.8%	17.4%	16.4%
University degree	12.2%	29.5%	12.9%	22.3%

Source: Statistics Canada 2001 Community Profiles

While education is of critical importance to increasing human capital within a community and region, it is just one of the two key activities of universities. The other is research. Compared to the educational levels listed in Table 3.4, even greater disparities can be seen when comparing rates of success in attracting research funding. This information is presented in Table 3.5. Prince George and Thompson have simply not been major research centres, especially in relation to the contributions they have made to their provincial economies.

Table 3.5 – Research Funding from Canada's Four Primary Research Granting Councils

Canada Foundation for Innovation funding to 2007[260]	City[261]	Funds Acquired	% of Provincial Total
	Prince George	$4 million	0.9%
	Vancouver	$350.7 million	82.2%
	Thompson	$0	0%
	Winnipeg	$52.67 million	96.9%
Social Sciences and Humanities Research Council funding in 2007[262]			
	Prince George	$132,855	1.2%
	Vancouver	$8,742,785	81.7%
	Thompson	$0	0%
	Winnipeg	$1,473,583	100%
Natural Sciences and Engineering Research Council funding in 2007[263]			
	Prince George	$1,494,444	1.5%
	Vancouver	$79,286,657	81.6%
	Thompson	$0	0%
	Winnipeg	$19,456,230	98.7%
Canadian Institutes for Health Research funding to 2007-08[264]			
	Prince George	$2,740,599	0.4%
	Vancouver	$567,576,032	93.4%
	Thompson	$0	0%
	Winnipeg	$155,550,747	99.8%

[260] Data from the Canada Foundation for Innovation identifies funding provided for research infrastructure to August 7, 2007: http://www2.innovation.ca/pls/fci/fcienrep.base.

[261] The data presented is the sum of funding allocated to post-secondary institutions, hospitals, and research institutes primarily located in the community. For example, The Vancouver statistics include funding provided to UBC, Simon Fraser University, the BC Cancer Agency, Forintek, etc. Similarly, the Winnipeg statistics reflect funding primarily provided to the University of Manitoba and the University of Winnipeg. In Prince George, UNBC is the recipient of research funding. According to the data available on the granting councils' websites as of August 7, 2007, UCN did not attract any research funding.

[262] SSHRC funding for 2007, as presented on the SSHRC website on August 7, 2007: http://www.sshrc.ca/web/winning/comp_results/2007/srg_2007.pdf.

[263] Students awards and research grants provided in the 2006-07 fiscal year by NSERC, as reported on the NSERC website on August 7, 2007: http://www.outil.ost.uqam.ca/CRSNG/Outil.aspx?Langue=Anglais.

[264] Funding provided by CIHR up to the 2007-08 fiscal year and reported on the CHIR website: http://webapps.cihr-irsc.gc.ca/funding/Search?p_language=E&p_version=CIHR.

The data presented in Table 3.5 shows where research investments have been made; not the location of where the research is being undertaken. It is possible that some research funding provided to the University of Manitoba, for example, was spent in Thompson and used to explore an issue of relevance to the northern Manitoba region. The fact of the matter remains, however, that research is concentrated in a few metropolitan centres. This also limits many of the benefits of research and development to a few metropolitan centres.[265]

What amount of research funding should non-metropolitan areas receive? This is a difficult question to answer but they will receive nothing unless they have a knowledge infrastructure that will enable the research to be undertaken, an interest in conducting research, and the ability to submit competitive research proposals. Research funding is allocated based on the merits of a particular proposal; not on the basis of geography, economic output, or population. The cities and regions without research-intensive universities will only benefit if researchers from elsewhere are drawn to the peripheral communities for their research. Even in these circumstances, the primary investment is made at the host university, not in the region.

The discrepancy highlighted in Table 3.5 is not meant to imply that non-metropolitan regions do not need or value research. To the contrary, many scholars who study the plight of resource-based communities and regions suggest that research and innovation are fundamental to the future sustainability of resource industries and the communities that

[265] Blouw, "Impact of Higher Education on Regional Development - Canada" (presentation at the Association of Commonwealth Universities conference, Perth, Australia, 2004).

depend on them.[266] The problem is that research activity is centralized in metropolitan centres and their citizens are increasingly disinterested in resource management and resource-based communities.[267] This leads to a fundamental conundrum facing the future of Canada's resource regions:

1. As described by Innis and others, the extraction and export of natural resources has served as the foundation of Canada's economy and political identity. The viability of the resource sector remains of fundamental importance to the national economy and society.
2. The application of research, innovation, knowledge, and skills to the resource sector – as well as to other components of the economy and society – are seen as vital ingredients to regional development. In fact, Mary Louise McAllister, writing about the challenges confronting mining and other resource-based communities, suggests that applying R&D and innovation to resource industries "might be viewed as the only practical route to diversification and growth of the country's economy."[268]
3. The locations with the greatest capacity for research and innovation (the metropolitan centres[269]) are isolated from and indifferent to resource communities and their value

[266] For examples, see McAllister, *Prospects for the Mineral Industry*, 8; Polèse and Shearmur, *The Periphery in the Knowledge Economy*, 204-206; Hutton, *British Columbia at the Crossroads*, 20-21; Freshwater, "Delusions of Grandeur," 36-40.
[267] For examples, see Weller, "Hinterland Politics," 8-13; Freshwater, "Delusions of Grandeur," 34-35; Veiga et al., "Mining With Communities," 192; and McAllister, *Prospects for the Mineral Industry*, 11-18.
[268] McAllister and Alexander, *A Stake in the Future: Redefining the Canadian Mineral Industry*, 26.
[269] Table 3.5 provides evidence of the concentration of research in metropolitan centres. For an additional example, the Government of British Columbia's Campus 2020 report identifies that the research-intensive universities in Vancouver and Victoria should by the primary BC locations for graduate-level education and receive 95% of the research funding. For details see pages 76 and 81: http://www.campus2020.ca/EN/the_report/.

to the Canadian economy.[270] The result has been described as a "crisis in Canada's northern research."[271]

In other words, the regions that have a great need for innovation are those least likely to have a local knowledge infrastructure with the capacity for undertaking research. Several writers[272] have identified this paradox in regional development and while it is not a positive situation for northern regions, it makes the addition of universities in Prince George and Thompson – two major centres of the Canadian resource landscape – a particularly important national development.

The University of Northern British Columbia

The University of Northern British Columbia (UNBC) was created by the Government of British Columbia in June, 1990, about three years after the start of a concerted public effort that included having sixteen thousand northern BC residents pay five dollars to sign a petition supporting the project. Their efforts were the latest in a series of developments that would see major changes to the province's post-secondary system. In 1962, the new President of the University of British Columbia – the only university in BC at the time – toured the province and wrote a report that advocated for the expansion of the post-secondary system.[273] As a result of this report, new universities were created in Victoria and Burnaby in addition to new community colleges in the Interior. While the region generally supported the idea of a college based in Prince George, opposition came from the Mayor and some local

[270] McAllister, *Prospects for the Mineral Industry*, 18.
[271] Charbonneau, "Crisis in Canada's Northern Research," 34.
[272] For examples, see Alasia, *Skills, Innovation and Growth*, 54; Tykkylainen, "The Knowledge Economy in a Core-Periphery System," 12; and Michie and Oughton, "Regional Innovation Strategies," 164-169.
[273] Howard, *The Origins of the College of New Caledonia*, 2-3.

elites, who questioned both the cost and the idea of "settling" for a college instead of pressing for a full university.[274] Although they did not succeed initially, local MLA Ray Williston was instrumental in setting aside land on the outskirts of Prince George if and when the city ever succeeded in acquiring a university.

There was little action until 1987 when forty local leaders gathered to advance the idea.[275] The Interior University Society was born. Over the following three years, its members toured the northern region selling the idea to residents, secured the services of a Swedish academic named Urban Dahllof with expertise on northern universities, and lobbied government politicians and bureaucrats. In response to this work, the Government of British Columbia created an Implementation Planning Group in 1989 that reviewed the feasibility of the concept and made recommendations concerning the new University's future. In 1990, the IPG's report was accepted and the BC Legislature officially created UNBC on June 21.[276] In doing so, MLAs passed the UNBC Act, legislation specific to a free-standing university that kept it separate from the other BC universities during its growth phase. The Act established an Interim Governing Council – with the power of both a Board and Senate – and provided it with $137.5 million to build and equip the University's core campus in Prince George. The first president, Geoffrey Weller, was hired in 1991 and the first faculty joined the following year.

During its formative years, UNBC aimed to be a university "in the north and for the north." This slogan was intended to characterize UNBC as a university like every other (with a broad

[274] Ibid., 6.
[275] McCaffray, *UNBC – A Northern Crusade*, 282-283
[276] University of Northern British Columbia, "UNBC History, 1987-1994," http://www.unbc.ca/unbchistory.

range of undergraduate, graduate, and professional degree programs; a strong focus on research, excellence, and scholarly inquiry; and a commitment to community service) and one uniquely situated as a resource for the northern region. The first UNBC courses were offered in 1992 in Prince George, Dawson Creek, Fort St. John, and Quesnel. In August 1994, Queen Elizabeth II presided over the official opening of the Prince George campus and three weeks later, the University attracted fourteen hundred students in its first semester of full operations.[277] The initial offerings consisted of nineteen undergraduate and twelve graduate degrees.[278] While degrees in human service professions were popular in regional campuses, Business Administration and the natural sciences (especially Forestry) attracted large numbers of students at the Prince George campus.

Within ten years, the Prince George campus was in the midst of another construction boom that would soon see it nearly triple in size from what it was in 1994.[279] Major new buildings included student residences, a forestry laboratory, and new buildings to accommodate the growth in science programs and professional degrees. The most significant new developments have been the addition of a sports facility and a health sciences centre that is the home of a physician training program called the Northern Medical Program (NMP).

The official opening of the NMP coincided with the University's 10th anniversary and marked a significant accomplishment in UNBC's intention to be both a real university and one particularly responsive to the North. The NMP, the result of collaboration between

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[277] Ibid.
[278] University of Northern British Columbia, *1994-95 Calendar*, 35-97.
[279] Godfrey Medhurst (Director of Campus Planning and former Director of Facilities, UNBC), in discussion with the author, May 2007.

UNBC and the UBC Faculty of Medicine, was born at a community rally in 2000, organized to protest the state of health care in Prince George and the northern region. Speaking at the rally, then-President Charles Jago suggested that the only solution for the region's difficulty in attracting and retaining physicians and other health professionals was to educate more of them in the region.[280] It was an argument akin to the message presented by UNBC's original founders. There was one main difference, however. While the University's early founders advocated for a university to serve northerners and provide opportunities close to home (thereby preventing brain drain), the medical program was seen as a way to expose future doctors to the region and encourage them to stay, regardless of whether the students are from the region or not (contributing to a brain gain).

The addition of new, often popular, programming helped the University grow from fourteen hundred to forty-two hundred students by the 2006-07 academic year.[281] City officials boasted that the College and University were contributing $721 million per year to the local economy.[282] As a percentage of the population, there were more people pursuing university-level education in Prince George than any other municipality in British Columbia.[283] Annual research funding had grown from one million dollars in 1994 to $18.8 million in the 2005-06 fiscal year.[284] Outside of Prince George, the University was sharing space with the local community colleges in Fort St. John, Prince Rupert, and Quesnel and had a free-standing campus in Terrace. Programming had been offered in more than a dozen aboriginal

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[280] Jago, presentation at Health Care Rally, Prince George, June 22, 2000.
[281] University of Northern British Columbia, *About UNBC: Guide and Statistics 2007*, 5.
[282] Initiatives Prince George, "Prince George's Education Economy," 2005, http://www.unbc.ca/assets/communications/publications/download/ecnomic_impact.pdf
[283] University of Northern British Columbia, "Prince George Tops for University Participation," *News Media Resources*, 24 November 1997, http://www.unbc.ca/releases/1997/particip.html.
[284] University of Northern British Columbia, *About UNBC: Guide and Statistics 2007*, 10.

communities/reserves, often specific to local languages and cultures. It all prompted former UNBC Chancellor George Pedersen to claim that "no other Canadian university has ever advanced so far in such a short period of time."[285]

Nevertheless, the rate of growth experienced during UNBC's first decade has not continued into its second. The University experienced a drop in annual enrolment for the first time in the 2002-03 academic year and this also occurred in 2004-05 and 2005-06.[286] The University's ability to recruit students is being affected by a declining number of high school graduates in northern BC, the addition of new universities in the BC interior as well as declining entrance requirements at the existing universities in Vancouver and Victoria, and a buoyant provincial economy. As a result, the University very publicly moved into a different phase of its development; from an era of growth to a new focus on ensuring the ongoing sustainability of the institution.[287]

The University College of the North

The history of post-secondary education in northern Manitoba goes back more than forty years. In 1966, Keewatin Community College (KCC) was established in The Pas, a community of (now) nearly six thousand people about four hundred kilometres to the southwest of Thompson. It was primarily oriented towards trades training, though access to university courses was addressed in 1970 when Manitoba's three southern universities

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[285] University of Northern British Columbia, *Update: A Newsletter for UNBC Alumni and Friends, Spring 2006*, 6.

[286] The annual student enrolment data was prepared in November 2006 by the UNBC Institutional Data Analysis and Reporting Team following a request for the data from the UNBC Office of Communications.

[287] UNBC's commitment to growth was articulated in a 1995 strategic plan, entitled *Planning for Growth*. The more recent focus on sustainability was central to budget decisions made in early 2007. See the University's budget planning website [viewed August 7, 2007] http://www.unbc.ca/budget.

(Manitoba, Winnipeg, and Brandon) established Inter-Universities North (IUN) to offer academic courses to communities above 53 degrees north latitude. Based at the KCC campus in Thompson, IUN offered first-year university courses, as well as full degrees in various professional programs: teacher education, social work, and nursing in 1974, 1983, and 1999 respectively.[288] While the programs have been successful at educating people specifically for professional employment in the region (the BSW program alone has graduated more than two hundred students over the past twenty years[289]), concerns over the lack of coordination and northern control – as well as the growing demand for post-secondary education in the North – were being voiced in a number of reports. These included a report on a northern polytechnic institution prepared by the Manitoba Post-Secondary Adult and Continuing Education Branch, a northern university proposal initiated by the Nelson House General Education Assembly, and a report by the Northern Manitoba Economic Development Commission.[290] In 1993, a Provincial Government-funded review of post-secondary education led by a former Manitoba premier identified a number of recommendations oriented to northern and aboriginal education. In particular, the Roblin Report called for increased coordination of northern programming and the creation of a First Nations Post-Secondary Education Council.[291] The aboriginal community in northern Manitoba was already actively engaged in discussions about the establishment of a northern university: the regional organization of northern Manitoba chiefs (the Manitoba Keewatinowi Okimakanak), for example, had passed

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[288] University College of the North Implementation Team, "Overview of Post-Secondary Education in Northern Manitoba: The Past Forty Years," http://www.ucn.mb.ca/UCNIT/post-sec/overview.html
[289] Ibid.
[290] University College of the North Steering Committee, "Appendix D, Review of Previous Research," *University College of the North: A Vision for Our Future*, September 2000.
[291] Manitoba, "Doing Things Differently: Report of the University Education Review Committee, December 1993," http://www.gov.mb.ca/educate/postsec/roblin/roblin.html

resolutions to establish a northern university in 1989, 1992, and 1998.[292] Finally, in 1999, the Government's Post-Secondary Education Council established a steering committee to investigate the expansion of university programming in northern Manitoba.

University College of the North: A Vision for Our Future was published in 2000. It was strongly endorsed by the MKO and makes the case for the northern institution by outlining several key factors: the growing aboriginal population and their educational needs, greater northern control over programming, governance and facilities, and projected costs.[293] By the autumn of 2002, the Province's Advanced Education Minister, Diane McGifford, commissioned a team led by Verna Kirkness to undertake a public consultation on the UCN proposal originally outlined by the Steering Committee in 2000. Kirkness' 36-page report, published in March 2003, was based on the consultations that were held in twelve Manitoba communities and included eighteen recommendations. These included creating a Centre for Aboriginal Studies and Research, expanding offerings through partnerships with other colleges and universities, making Thompson the primary academic centre and The Pas the main vocational centre, coordinating all degree programs in the North through UCN, and building a new campus in Thompson to replace the collection of old buildings that were previously occupied by INCO employees.[294] More than an action plan with recommendations, however, the Kirkness report is a passionate plea for northern and aboriginal self-determination through education, supported by numerous public testimonials that were gathered during the consultation process. One resident of the region suggested that

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[292] University College of the North Steering Committee, "Appendix A, Correspondence and Resolutions," *University College of the North: A Vision for Our Future*, September 2000.
[293] University College of the North Steering Committee, *University College of the North: A Vision for Our Future*, 2-7.
[294] Manitoba, Report of the Consultation on Post-Secondary Education in Northern Manitoba, "University College of the North: Recommendations and Action Plan," March 2003, 5-16.

"[w]e cannot run the risk of being legitimized by others; we can only be legitimized by ourselves. Our goal must be clear…our own, full degree granting institution, right away."[295] Another suggested that the addition of a university in the North would encourage Aboriginal residents to "come flooding back."[296] Clearly, proponents were associating the creation of UCN with the cultural sustainability of northern Manitoba.

Short of appreciating how the new institution would improve morale in the region and increase access to advanced education, it is difficult to identify the link between UCN and the longer term economic stability of communities such as Thompson. The words *nickel*, *forestry*, or *resource extraction* never appear in either the Kirkness report nor the initial vision of UCN that was published in 2000. The economic impact is limited to the possible construction of a new campus in Thompson and a prediction of increased students, staff, and faculty that will be attracted to the new institution. In the Kirkness report, the section that concludes with a recommendation on how UCN will be a "vehicle for expressing and addressing the economic aspirations and development of the North" contains only three sentences.[297] In short, education is seen as a means to empowerment but not to economic diversification. First and foremost, the UCN is promoted as a vital tool for the aboriginal population. In fact, it is estimated that aboriginal people make up 65% of northern Manitoba's total population of nearly eighty thousand people.[298]

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[295] Ibid., 7.
[296] Ibid., 17.
[297] Ibid., 9.
[298] University College of the North, *2005-06 Annual Report*, 6.

Increasing the education level of northerners (primarily aboriginal people) through the creation of UCN was a strategy of the Manitoba Legislature. Shortly after the presentation of the Kirkness report, the Government created an implementation team to initiate the transition from Keewatin Community College to the University College of the North. The legislation creating UCN was introduced and passed in 2004. It makes provision for governing structures that are unique in Manitoba, such as the formation of a Council of Elders that must ensure that "Aboriginal and northern cultures and values"[299] are respected and embraced by the institution. In fact, the Act plainly states that the purpose of UCN is to serve the educational needs of Aboriginal and northern Manitobans and "enhance the economic and social well-being of northern Manitoba."[300]

The new institution began to offer its first university programming in September, 2005, and the total enrolment of UCN that academic year was twenty-six hundred (including university-level courses, trades training, contract courses, and continuing education) – a 41% increase since 1999.[301] University enrolments remained the minority, however, possibly because UCN had only one degree program that year, a Bachelor of Arts in Northern and Aboriginal Studies. At the Thompson campus alone, the BA attracted nineteen students in year one.[302] Nevertheless, UCN is aiming to increase its degree roster, adding a Bachelor of Education in 2007 and a Bachelor of Science in Natural Resource Management in 2008.[303] This growth is

[299] Bill 20, *University College of the North Act*, 2nd sess., 38th Legislature, 2004 (assented to 10 June 2004) Legislature of Manitoba.
[300] Ibid.
[301] New Democratic Party Caucus of Manitoba, "Sustaining Communities in the North," http://www.ndpcaucus.mb.ca/?q=node/45
[302] University College of the North, *Annual Academic Report 2005-2006*, 28.
[303] Ibid., 16.

to be facilitated by the construction of a new, $30 million campus in Thompson that is expected to be under construction by the spring of 2008.[304]

Conclusion

The creation of UCN and UNBC are illustrative of changes that have been underway in both Prince George and Thompson concerning public recognition of the importance of universities in empowering communities and diversifying economies. In both cases, local and regional citizens played an active role in convincing the provincial governments – often over the course of many years – that creating universities in the North was sound public policy. The outcome, however, has been different. UNBC started as a free-standing university with an impressive campus, a large selection of degree programs, and an early commitment to research that has enabled it to emerge as one of the most research-intensive small universities in Canada. In Thompson, UCN is undertaking a phased evolution, with degree programs being developed and added over time.

Both universities are similar, however, in that they were created by their provincial governments to serve the particular needs of the northern regions, both of which are heavily dependent on the extraction of natural resources and are struggling to compete in an increasingly knowledge-based economy. Thompson and Prince George are both far behind the metropolitan centres in their provinces in terms of university completion rates and success in attracting research funding. The following chapter will present these case studies within the context of appurtenancy to assess whether the creation of the universities has been

[304] Manitoba, "Province Plans University College of the North Campus for Thompson," *News Releases*, March 13, 2007, http://news.gov.mb.ca/news/index.html?archive=2007-3-01&item=1336.

evidence of a new implicit social contract between the state and the northern regions that recognizes the importance of an infrastructure for developing human capital in addition to an infrastructure that supports the extraction and export of natural resources.

Chapter Four

Knowledge Appurtenancy: Reviving a Policy for Regional Development

This chapter will illustrate how appurtenancy is a relevant tool for regional development in the knowledge-based economy. Evidence will be drawn from Prince George and Thompson and their experiences in creating a knowledge infrastructure that is seen to be a vital ingredient for modern regional development.

Both communities and their regions are major players within a resource landscape that has shaped Canada's political and economic context. This context is critical to the discussion and will lead into a review of the problems and opportunities currently facing resource-based regions. Realizing these opportunities requires a policy response. In a different time, appurtenancy was such a policy, enabling economic growth and some regional development. The creation of universities in Thompson and Prince George illustrates that many of its principles and characteristics remain valid today as "knowledge" appurtenancy.

The Context

As a whole, Canada has been shaped by the extraction of natural resources and this remains especially true for many areas – especially northern regions – outside of the metropolitan centres. Initially articulated by Harold Innis, the Staples Theory described how the exploitation and export of Canada's vast natural resources – fish, fur, minerals, timber, etc – was largely led by foreign interests to the detriment of Canada and its resource regions. "The

result, to use Innis's terminology, is that staples-producing regions and nations became dependent on more powerful foreign metropoles, and consequently remained on the global economic margin."[305] Even if these metropoles are of the same nation, they are foreign to the region itself.

While the staples theory is no longer applicable to Canada in its entirety, it is still appropriate for understanding the plight of most of non-metropolitan Canada and definitely of the two communities and their regions that are described in this thesis. There is some discrepancy of precise numbers of resource-dependent communities in the academic literature,[306] but it is clear that many communities in Canada continue to be dependent on the extraction of natural resources. Natural Resources Canada, for example, estimates that nearly two thousand communities nationwide are at least 30% resource-reliant,[307] primarily because of the jobs that resource industries produce. But beyond their importance as employers, these industries produce export wealth. In British Columbia, resources from non-metropolitan areas account for the majority of provincial exports,[308] even though they come from regions that have a minority of the provincial population.

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[305] Barnes, "Borderline Communities: Canadian Single-Industry Towns, Resources, and Harold Innis," 110.
[306] For examples, see Randall and Ironside, "Communities on the Edge: An Economic Geography of Resource-Dependent Communities in Canada," 17; Veiga et al., "Mining with Communities," 192; McAllister, "A Stake in the North: Prospects for Employment in Mining Towns," 1; and Williamson and Samson, "Forest Communities in Transition: An Empirical Assessment of the Changing Structure of the Rural Forest Economy," 14.
[307] Natural Resources Canada, "Resource-reliant Communities, 2001," *The Atlas of Canada*, http://atlas.nrcan.gc.ca/site/english/maps/economic/rdc2001/rdcall.
[308] For examples, see Baxter et al., "Regions and Resources: The Foundations of British Columbia's Economic Base," 4-5; Jackson and Curry, "Regional Development and Land Use Planning in Rural British Columbia," 439; and Business Council of British Columbia, "BC's Prosperity is Still Closely Tied to the Resource Sector," 3-5.

The Problem

While resources remain a source of significant wealth, their proportional importance in provinces such as British Columbia is declining.[309] The other major trend concerns population, which has been declining in resource-based regions, both in absolute numbers as well as in proportion to the overall provincial totals. As Weller states in an early article on the "subprovincial hinterlands," the political and economic problems these regions face are rooted in their historical dependence on extraction: "all of the key segments of the region's economy, therefore, are based upon the needs of another region... Many of the region's residents feel that resources are siphoned off from the region. It is usually thought this is done via two key industries, forestry and mining."[310] At least industries such as forestry and mining attracted infrastructure and created well-paying jobs locally. This is no longer happening to the same extent. The experience of the resource industries in Prince George and Thompson has been that industry productivity is no longer correlated with employment levels, such that direct employment has decreased while industrial output has increased. At the same time, the productive capacity of the land base for some industries in some areas is being met or even exceeded.

Against this overview of the current state of resource industries, the communities themselves are losing highly skilled people – including those in the resource industries themselves – to metropolitan centres. This is part of a trend to centralize high-order services in metropolitan centres that have both the agglomeration economies and the knowledge infrastructure to

[309] Business Council of British Columbia, "BC's Prosperity is Still Closely Tied to the Resource Sector," 2.
[310] Weller, "Hinterland Politics: The Case of Northwestern Ontario," 8.

support them and maximize their operations. It is in these services, and consequently in the big cities, where employment and economic growth is greatest.

The result is a "double-whammy" for resource communities: 1) employment in their traditional industries is declining and 2) the areas of employment growth are in services that are concentrated in big cities. It does not stop there. McAllister claims that the political alienation resource regions feel is likely to get worse. While they once enjoyed national prominence and political attention, resource regions are now as likely to feel ignored. She argues that as the population increasingly becomes concentrated in metropolitan cities away from the daily reality of resource industries, public attitudes are changing and are increasingly indifferent towards resource communities, leading to unsupportive or absent government policy.[311] Essentially, the residents of metropolitan centres are losing interest in the regions. Inspired by the likes of Jane Jacobs, Richard Florida, and the metropolitan-based media, it is now a common belief that big cities are the sources of creativity, the homes of the "next big idea," and the gateways to a global world. Part of the reason for this is that metropolitan regions have a knowledge infrastructure, while most non-metropolitan areas do not.

The Opportunity

The lack of a knowledge infrastructure and the lower rates of university attendance in many non-metropolitan communities have been blamed on demand; that a university education has

[311] See McAllister, "Prospects for the Mineral Industry," 1-18; and McAllister, "A Stake in the North," 4.

no value within a predominantly resource-based economy.[312] Supply, however, is also a factor. Statistics Canada published a study in 2007 on changes in local university participation rates after the creation of new universities and found that "[u]niversity attendance among local youth in each community increased far more than in other parts of the country... For example, the University of Northern British Columbia opened its doors in Prince George in 1994. Among fifteen to nineteen-year-old youth living in Prince George in 1991, 18% had attended university within the next five years. In 1996, following the creation of UNBC, this figure rose to 27%."[313] The experience of Prince George confirms that the local presence of a university helps to increase the numbers of local residents who pursue a university education. This is important because numerous reports and research publications link educational attainment to human capital,[314] and further suggest that human capital is fundamental to regional development today. Consistent with a greater focus on regional innovation and economic development, "the role of universities in regional development has been seen as going beyond [a] narrow technical and economic approach to embrace the role of universities in enhancing the stock of human capital within a region."[315]

Connecting universities to regional development has been identified as a priority across Canada. A report on rural development in western Canada cites higher education as the number one priority for strengthening communities.[316] Writing specifically about British

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[312] See Bollman, *Linkages Between Human Capital and Rural Development*, 6; Marchak, *Green Gold*, 26; and Alasia, *Skills, Innovation, and Growth*, 48.
[313] Statistics Canada, "Study: Post-Secondary Attendance Among Local Youth Following the Opening of a New University," *The Daily*, January 25, 2007, http://www.statcan.ca/Daily/English/070125/d070125a.htm.
[314] See Alasia, *Skills, Innovation, and Growth*, 10; Crocker, *Human Capital Development and Education*, 1; and Pike and Kuh, "First- and Second-Generation College Students: A Comparison of their Engagement and Intellectual Development," 1.
[315] Goddard, *Universities and Regional Development: An Overview*, 2.
[316] Azmier and Lozanski, *Fighting the Odds: Rural Development Strategies for Western Canada*, 10-11.

Columbia's future economic prospects, Thomas Hutton suggests that higher education is "perhaps the most critical public policy field for regional development in the 21st century."[317] Similarly, Polèse and Shearmur suggest that higher education and skilled labour "must be at the heart of any strategy aimed at facilitating transition to the knowledge-based economy."[318] All stop short, however, of actually describing how universities can play a key role in regional development and none suggest that an increased spatial distribution of universities has potential, even though the experiences from elsewhere show that it is possible.

The Nordic countries – especially Finland, Sweden, and Norway – are generally perceived to be the best examples of how northern universities can help to stabilize and improve regions that were once dependent on the extraction and export of natural resources.[319] In Sweden, efforts by the national government to distribute university campuses throughout the country have been called the "centrepiece of its modern regional development activities."[320] Elsewhere, Tromsø (Norway) has emerged as a major centre for medical teaching and research while Oulu (Finland) has built a significant economy based on high-tech research and manufacturing – neither would have been attainable without a university infrastructure located in the North.[321] The examples from the Nordic countries indicate that northern

[317] Hutton, *BC at the Crossroads*, 20.
[318] Polèse and Shearmur, *The Periphery in the Knowledge Economy*, 206.
[319] Nord, "The Role of Universities in Northern Development: A Comparative Perspective," 185.
[320] Andersson et al., "University Decentralization as Regional Policy: The Swedish Experiment," 373.
[321] See Arbo and Fulsås, "The University of Tromso," 57-60; Arbo and Eskelinen, "The Role of Small, Comprehensive Universities in Regional Economic Development," 36-37; and Salo, "Pohjoinen Alma Mater," 617.

universities established in resource-based regions can have a significant effect "upon the productivity of local areas and the local economies in which they are situated."[322]

The Reality Check

While the Nordic countries have benefited from a government commitment to distribute universities throughout the country, the Canadian experience is much different. In fact, among the thirty countries in the Organization for Economic Co-operation and Development (OECD), "Canada has the biggest urban-rural gap in the share of the workforce with university or college graduation."[323]

This low level of educational attainment is just one factor conspiring against resource-based regions that are peripheral to metropolitan centres. In an article titled "How Can We Halt the Demise of Canada's Peripheral Regions?," Polèse and Shearmur suggest that these regions will continue to see population decline until they reach a "new equilibrium" with fewer people.[324] Shearmur goes a step further, suggesting in a book on economic development in peripheral regions over the past three decades, that "a central question is not so much the *development* of peripheral areas, but rather the *management of decline.*"[325]

Even authors who are not as pessimistic seem to have difficulty suggesting actions that will make things better for peripheral regions. In fact, a number of publications conclude with statements that could otherwise serve as introductory comments for articles that would move

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[322] Andersson et al., "University Decentralization as Regional Policy: The Swedish Experiment," 387.
[323] Bollman, *Linkages Between Human Capital and Regional Development*, 3.
[324] Polèse and Shearmur, "How Can We Halt the Demise of Canada's Peripheral Regions?" 52.
[325] Shearmur, *Economic Development in Canadian Peripheral Regions, 1971 to 1996: A Statistical Overview*, 105. Emphasis in the original.

beyond simply describing the challenges facing resource-based, peripheral regions. Here is a sample:

- In the conclusion to an article about BC's resource-based communities: "If there is an opportunity to do something different, to experiment, to engage in alternatives, we should... Certainly, time has run out for some people living in BC's borderline communities."[326]
- The last sentence in a book about forest policy: "It becomes essential, as well, to develop non-forest-based industries for rural communities."[327]
- The last sentence of a 57-page report reviewing the literature on the link between skills, innovation, and non-metropolitan development: "Relatively little research has been carried out on the innovation process in smaller communities and non-metropolitan regions."[328]
- At the end of Hutton's review of regional development in British Columbia: "This relatively weak regional development policy experience may not have mattered in an era of (perceived) unbounded resource stocks, expectations of strong export markets, and relatively weak international competitors, but in this very different context of the early 21st century, there is now a pressing need to develop more imaginative and innovative approaches to the future of British Columbia's regions and communities."[329]

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[326] Barnes, "Borderline Communities: Canadian Single-Industry Towns, Resources, and Harold Innis," 120.
[327] Marchak et al., *Falldown: Forest Policy in British Columbia*, 113.
[328] Alasia, *Skills, Innovation, and Growth*, 57.
[329] Hutton, *British Columbia at the Crossroads*, 27.

The Policy Imperative

The "relatively weak regional development policy experience" described by Hutton matters because, as Halseth suggests, rural communities need tools to enable their development and "in the Canadian context, many of these tools come in the form of public policy."[330] Such policy would have the effect of providing communities and regions with greater capacity for developing and implementing options for local development. In an increasingly knowledge-based economy, this capacity would require education, skills, and research, with a focus on innovation particular to the circumstances of a particular region. All are present in metropolitan centres with their sophisticated knowledge infrastructure, but "the regions most in need of innovation also tend to have the weakest capacity to absorb public funds earmarked for the promotion of innovation and to invest in innovation-related activities."[331] Writing for Statistics Canada, Alasia calls it the Regional Innovation Paradox, basically defined as "those who need it most, get it least."[332] Feldman *et al.* do not agree that non-metropolitan regions need innovation more than metropolitan centres, but in assessing the practice of applying research and innovation to a region, they do recognize that "there is a penalty for being at the periphery."[333]

Peripheral regions in Canada will continue to be penalized as long as government policy continues to focus primarily on natural resource industries.[334] New requirements have come about concurrent with economic changes that highlight the importance of knowledge, skills, and research capacity. In this context, "peripheral regions are going to find it very difficult to

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[330] Halseth and Halseth, "Introduction," 17.
[331] Arbo and Benneworth, "Understanding the Regional Contribution of Higher Education Institutions," 21.
[332] Alasia, *Skills, Innovation, and Growth*, 54.
[333] Feldman et al., "The importance of proximity and location," 5.
[334] Freshwater, "Delusions of Grandeur," 36.

meet these challenges without a new policy strategy. A difficult situation could turn into a disastrous one."[335]

For both resource-based communities and the state, this "disastrous outcome" would see the metropolitan centres increasingly moving away from the periphery: socially, economically, and politically. This gulf has been identified by Cooke and Leydesdorff as something that needs attention from governments. They write that,

> ...the core cities are highly privileged in most countries while the peripheries are generally impoverished and becoming more so, presaging major out-migration of youth and the metamorphosis of such areas into socially deserted or playground economies. The policy imperative to devise mechanisms by which non-metropolitan regions may, in future, participate in the knowledge-based economy is clearly overwhelming.[336]

This is easier said than done. Beyond the fact Canada has had little history or experience in crafting successful regional development policies or plans for resource-based regions, there are two main challenges to devising appropriate policy mechanisms. First, Canada's federal structure divides the jurisdiction for many policy options. Knowledge and innovation is an example. While *research* funding is administered by the federal government and its agencies, the primary jurisdiction for *operating* and funding universities lies with the provinces. Also complicating the issue of responsibility is the country's sheer size and regional peculiarities. Legislators must consider local cultures, local institutions, and local economies, while also recognizing that all regions – especially those dependent on the export of natural resources – are subject to similar national and international forces.[337] Second, there are limited models of

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[335] Lamarache, *Capitalizing on the Information Economy: A New Approach for Regional Development*, 162.
[336] Cooke and Leydesdorff, "Regional Development in the Knowledge-Based Economy," 9.
[337] Doloreux et al., "Learning and Innovation: Implications for Regional Policy," 14.

success upon which to base policy, especially in Canada. Much of the research and literature on the regional development effects of knowledge and innovation are focused on a few examples from large cities and their development of large, high-tech industries.[338] Northern, resource-based, and rural areas are rarely discussed as areas that even have the *potential* for knowledge and innovation, let alone as sites with successes that can be emulated. This is not limited to discussions of regional development in the knowledge-based economy. In assessing the application of broad disciplinary research to these regions, Hayter *et al.* suggest that "resource peripheries are treated not only as peripheral places, but peripheral to disciplinary theorizing. An economic geography dominated by post-industrial, service-oriented economies has no interest in what is perceived as 'old-fashioned' resource geography."[339]

A Response: Knowledge Appurtenancy

American rural policy specialist David Freshwater believes that while place-based policy has become a popular policy recommendation, "it has *not yet been successfully implemented in any nation*."[340]

For a time, appurtenancy, especially in the British Columbia forestry context, was an example of a successful place-based policy. Combined with other provincial government investments, policies, and programs (such as tenure, sustained yield, and investments in transportation infrastructure), it succeeded in guaranteeing that communities and regions

[338] See Markey et al., "The Struggle to Compete," 26; Arbo and Eskelinen, "The Role of Small, Comprehensive Universities in Regional Economic Development," 46; Alasia, *Skills, Innovation, and Growth*, 57.
[339] Hayter et al., "Relocating Resource Peripheries to the Core of Economic Geography's Theorizing: Rationale and Agenda," 16-17.
[340] Freshwater, "Delusions of Grandeur," 35. Emphasis added.

would capture some wealth from neighbouring forests. But prior to its elimination in 2003, appurtenancy was failing to live up to ideals. The forest industry claimed that it needed greater operational flexibility to remain competitive and mills were closing. While it may have outrun its usefulness as a policy intended to stabilize resource-based communities,[341] what is the policy response that will help to sustain these communities in the future? In a manifesto aimed at bringing stability back to forestry communities, Ben Parfitt proposes a 'new' appurtenancy, one that would establish new rules related to forest management and the local operation of processing facilities.[342] Doing so, however, would be a short-term fix, ignoring the economic pressures being faced by industry as well as other research on the actual needs of resource-based communities and the emerging literature on the role of universities, research/innovation, knowledge, and human capital in modern regional development. In fact, on page one of her groundbreaking book on the BC forest industry and forestry-dependent regions, Patricia Marchak states that "no further development will occur in the future unless positive government action and public investments are directed toward the diversification of the economic base."[343] Thus, reconceptualising appurtenancy as a policy for regional development should take us away from a narrow focus on forestry and resource management. In doing so, the remainder of this chapter will describe how the creation of universities in Thompson and Prince George are evidence of the intents and outcomes of appurtenancy that were presented in chapter one. These characteristics include economic inefficiency, restriction of access, and the fact the decision to implement it is made outside of the region itself. However, it also formalizes a connection to a defined region that enables a decentralization of economic activities, local governance/management, benefits

[341] Parfitt, *Getting More from Our Forests*," 42.
[342] Ibid.
[343] Marchak, *Green Gold*, 1.

without direct ownership or jurisdiction, provision of benefits to the state, and a social contract enabled by the state. In describing how these factors apply to the new northern universities, henceforth this 'new' appurtenancy will be named 'knowledge appurtenancy.'

There are a range of actors that interact in this reconceptualised notion of knowledge appurtenancy. Clearly the state has a key role to play, both as the initiator of policy and a major beneficiary. Industry is another major actor that benefits from the production of skilled workers and the application of research. Together with the university itself, these actors comprise the Triple Helix that was described in chapter two. But while popular in the academic literature, the triple helix does not define the role of the community/region. As will be demonstrated, this omission is rectified in knowledge appurtenancy.

Physical Proximity

This presentation of knowledge appurtenancy starts with the realization that appurtenancy has important economic, political, and geographic components. Perhaps the most fundamental is the geographic factor; namely, the issue of physical proximity and responsibility to a region. For Prince George and Thompson, this has been realized by actually locating university campuses in the communities. This is most significant. Commentators and scholars have struggled to identify ways of increasing the presence of universities in non-metropolitan regions, without simply suggesting a greater spatial distribution of universities. Instead, the options have included providing tuition relief for

students from targeted areas[344] and using the Internet to connect these regions to university programming.[345] In fact, the Internet was supposed to overcome the importance of physical proximity and be a great equalizer for rural communities in their struggle to attract people and economic opportunity. In a book published in the late 1990s, Savoie argued that "new economic activities are increasingly geographically free."[346] More recently, however, scholars are claiming that the "death of geography" has been exaggerated or at least premature,[347] suggesting that while communications technology may be useful for conveying *information*, it is not as effective for sharing *knowledge*. Instead, they describe a fairly localized diffusion of expertise and research-based know-how from university campuses, defined as "knowledge spillovers."[348] Following research conducted in Australia, Keane and Allison suggest that these localized knowledge spillovers – measured in terms of education, knowledge, skills, and know-how – actually characterize the value of higher education to local and regional economies,[349] adding that the value of this local infrastructure "cannot be overstated."[350] In fact, private firms that engage in research are most likely to do so with a

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[344] Polèse and Shearmur, *The Periphery in the Knowledge Economy*, 206.
[345] A comment made by University of Waterloo President, David Johnston, during an online forum hosted by the *Globe and Mail*, as part of its "Manufacturing Change" series. The comment was posted on April 28, 2006. http://www.theglobeandmail.com/servlet/story/RTGAM.20060428.wnew-economy-chat28/BNStory/ManufacturingChange/home.
[346] Savoie, *Rethinking Canada's Regional Development Policy: An Atlantic Perspective*, 38.
[347] Morgan, "The Exaggerated Death of Geography: Learning, Proximity, and Territorial Innovation Systems," 3.
[348] See Ibid., 3-5; Arbo and Benneworth, "Understanding the Regional Contribution of Higher Education Institutions," 18; Alasia, *Skills, Innovation, and Growth*, 57; Keane and Allison, "The Intersection of the Learning Region and Local and Regional Economic Development: Analysing the Role of Higher Education," 896-897.
[349] Keane and Allison, "The Intersection of the Learning Region and Local and Regional Economic Development: Analysing the Role of Higher Education," 896.
[350] Ibid., 897.

nearby university, making the "proximity effect" of universities higher than any other external knowledge source.[351] In other words, location within the region matters.

UNBC and UCN are intended to have positive consequences (increases in university participation rates, production of skilled personnel, research activity, application of research to local/regional industries, etc.) in the region around the core campuses. But as in forestry appurtenancy, the actual size of this region is not uniform. Instead, it could be thought to vary with the size of the university and the population base needed to sustain it. The size also varies with an identification of the region intended to benefit from "knowledge spillovers," primarily through the provision of skilled personnel and the application of research. In both northern BC and northern Manitoba, the universities were created to serve well-defined regions. UNBC's original legislation describes the University's region as the area covering the Northern Lights, Northwest, and New Caledonia College regions, in addition to the northern part of what was the Cariboo College (now, Thompson Rivers University) region. In Manitoba, the University College of the North has a legislated requirement to serve the educational needs and socio-economic well-being of northern Manitoba.[352] The Government of Manitoba defines northern Manitoba as the 82% of the province's land mass north of Township 21.[353] No other university in Manitoba or BC has a regional mandate.

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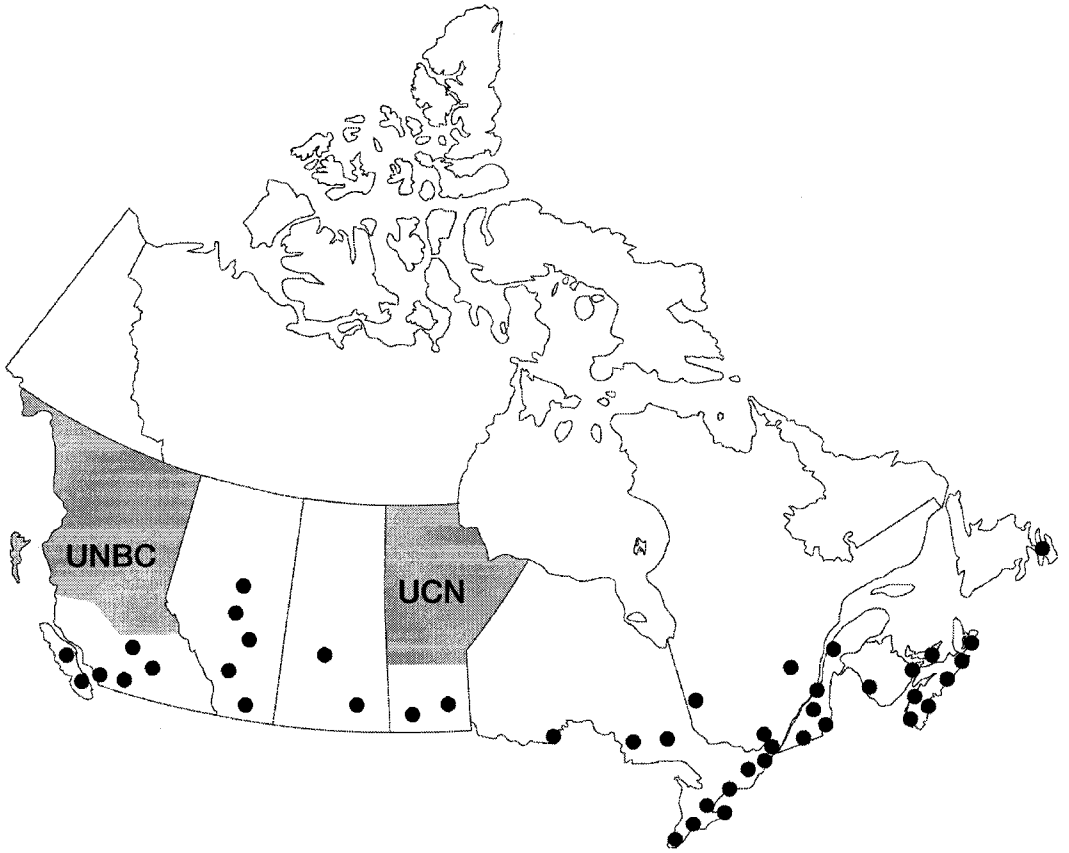
[351] See Doutriaux, "Private sector-financed research activities at Canadian universities: Distribution and recent trends," 99; Arundel and Geuna, "Does Proximity Matter for Knowledge Transfer from Public institutes and Universities to Firms?" 28.

[352] Bill 20, *University College of the North Act*, 2nd sess., 38th Legislature, 2004 (assented to 10 June 2004) Legislature of Manitoba.

[353] See Manitoba, "Aboriginal and Northern Profile," *Ministry of Aboriginal and Northern Affairs*, http://www.gov.mb.ca/ana/community/profile.html and Bill 33, *The Northern Affairs Act,* 5th sess., 38th Legislature, 2006 (assented to 7 December 2006) Legislature of Manitoba.

In Canada, the vast majority of universities are located in southern, metropolitan centres. Without regional mandates, their knowledge spillovers are similarly concentrated in the south. The experiences of UCN and UNBC are different: their legislated mandates formalize a relationship with their regions in a way that is similar to the original concept of forestry appurtenancy.

Figure 4.1 – The location of universities in Canada with an indication of the regions served by the University of Northern British Columbia (UNBC) and the University College of the North (UCN).[354]



[354] The location of Canadian universities is based on the membership of the Association of Universities and Colleges of Canada. The AUCC membership is depicted online at http://www.aucc.ca/can_uni/our_universities/index_e.html. The regions assigned to UNBC and UCN are approximations and are meant for illustrative purposes.

Despite the clear regional roles for UNBC and UCN, it is not appropriate to think of their regional boundaries as impenetrable. A free flow of ideas and people is vital to knowledge-creation and development, but UNBC and UCN are rare examples of universities created with strong regional connections and responsibilities.

Local governance/management

While proximity is considered here in the geographic sense, it also carries with it social and political dimensions. One of the principles of appurtenancy that was articulated by Choe was the notion that a resource is best managed by those closest to it. UNBC and UCN are both examples of this, in that the governing bodies for both institutions have large local/regional contingents. How this is actually implemented at the two institutions, however, is different. As established in its own legislation, UCN is governed by a Governing Council, which is advised by two other bodies: a Learning Council and a Council of Elders, which is expected to ensure that the institution "respects and embraces Aboriginal and northern culture and values."[355] The membership provisions for each Council further identify that, in practice, a majority of members will be residents of northern Manitoba. UNBC used to have its own legislation with provision for regional Governors and Senators, but this ceased to be the case after the University had annual enrolments of more than 2500 full-time equivalent students for two consecutive years. Upon reaching this milestone, the UNBC Act was dissolved and replaced by the Universities Act of British Columbia, the same legislation governing all of BC's universities. This eliminated the region-specific membership on the University's two governing bodies – its Board of Governors and Senate – but, because it was explicitly sought

[355] `Bill 20, *The University College of the North Act*, 2nd sess., 38th legislature, 2004 (assented to 10 June 2004) Legislature of Manitoba.

by the University, the regional distribution of Senators and Governors has been preserved by the provincial government.[356] Currently, both bodies have a majority of members from northern BC.

Local/regional governance of UCN and UNBC was a key factor in the establishment of both institutions, connecting the physical campuses and their activities to the aspirations and needs of the region. Prior to the establishment of UCN, for example, northern Manitoba had access to university programming through the Inter-Universities North partnership, whereby degree completion was made available through an extension of programming originating in Winnipeg or Brandon. While this provided access, the partnership provided no local control over the content of the curriculum. UCN's legislation and governing structure rectify this, enabling the institution to develop its own degrees that give UCN "a unique opportunity to incorporate Aboriginal knowledge and culture into programming."[357] The founders of UNBC, meanwhile, rejected a university-college model precisely because it would have meant deferring to a southern university for the sanctioning of degree programming. Local autonomy, in fact, was the first of seven pillars that defined the university envisioned by its founders.[358]

Local benefits without ownership or political jurisdiction

In addition to local governance, the creation of UNBC and UCN has brought local benefits. It is impossible in this section to provide an exhaustive summary, but many of the benefits are

[356] Charles Jago (former President, University of Northern British Columbia) in an email to the author, 4 January 2008.
[357] University College of the North, *2005.2006 Annual Report*, 1.
[358] McCaffray, *UNBC: A Northern Crusade*, 146.

both economic and social. This is typical of all universities but in an often-cited assessment of the local effects of higher education, Roisin Thanki suggests that the economic impacts are often valued more.[359] Considering first the value of construction, the original cost to build and equip UNBC's Prince George campus was $137 million, but since 1994, expansion of the campus has attracted more than $100 million in additional construction. While not all of the construction funds were spent locally, the majority of labour and a significant amount of the materials (especially concrete and wood) were sourced from within northern BC. In Thompson, the Government of Manitoba is investing $30 million in a new campus, with construction to begin in 2008.[360] Other major components of economic impact include local spending from the operating budget, employee salaries, student spending, and research funding. While never rigorously analyzed for either Prince George or Thompson, estimates for Prince George indicate that the annual economic impact from these sources is more than $225 million per year.[361] This is significant in an economy that has traditionally been at the mercy of booms and busts related to resource extraction.

Another major local benefit concerns the retention of graduates. Graduate surveys conducted in British Columbia show that UNBC grads are highly satisfied, report greater skill development than other BC university graduates, and enjoy employment rates consistent with the BC average for university graduates. These surveys also show that UNBC annually provides the region with more university graduates than the other BC universities combined.

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[359] Thanki, "How Do We Know the Value of Higher Education to Regional Development?" 84.
[360] Manitoba, "Province Plans University College of the North Campus for Thompson," *News Releases*, March 13, 2007, http://news.gov.mb.ca/news/index.html?archive=2007-3-01&item=1336.
[361] These figures combine the contribution of the University with the College of New Caledonia. They were presented in a publication titled *Prince George's Education Economy*, jointly produced by UNBC, CNC, and Initiatives Prince George in September, 2005.
http://www.unbc.ca/assets/communications/publications/download/ecnomic_impact.pdf.

For example, a 2006 study of students who graduated in 2004 showed that UNBC provided 197 of the 353 grads living in northern BC at that time.[362] Retention of graduates in northern regions, however, may be decreasing over time. For example, a 2002 assessment of the graduating class of 2000 showed that 49% were still living in northern BC.[363] By 2005, however, the proportion had dropped to 43%.[364] No reasons were given for the decrease. In Thompson, there are no graduates of UCN yet, but a survey of Keewatin Community College graduates from 2004 indicates that 83% are employed, with 8% actively looking for work.[365] Among the university-level programs, UCN reports that approximately 75% of the graduates from the Nursing program work in northern Manitoba after completing their degrees.[366]

An exogenous policy decision

Local governance and local benefits have both been realized even though the regions themselves have no political jurisdiction over higher education. The decision to create UNBC and UCN was ultimately made by their respective provincial governments. In this respect, the creation of the northern universities represented an exogenous policy decision because even while the regions lobbied for many years for the creation of their universities, the decision was ultimately made outside of the region. This is exactly how the creation of new, non-metropolitan universities in Sweden was described, where "exogenous changes in

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[362] The University Presidents' Council of British Columbia, "2006 Survey of 2004 Graduates," *University Baccalaureate Graduates Survey (UBGS),*
http://www.tupc.bc.ca/student_outcomes/publications/graduate_outcomes/.
[363] The University Presidents' Council of British Columbia, "2002 Survey of 2000 Graduates," *University Baccalaureate Graduates Survey (UBGS),*
http://www.tupc.bc.ca/student_outcomes/publications/graduate_outcomes/.
[364] The University Presidents' Council of British Columbia, "2005 Survey of 2000 Graduates," *University Baccalaureate Graduates Survey (UBGS),*
http://www.tupc.bc.ca/student_outcomes/publications/graduate_outcomes/.
[365] University College of the North, *2005.2006 Annual Report*, 13.
[366] University College of the North, *2005.2006 Annual Academic Report*, 13.

educational policy"[367] had local effects on regional development. The local benefits are similar to the usufructory rights communities enjoyed under forestry appurtenancy, where they received benefits associated with hosting timber processing facilities even though they had no jurisdiction or ownership of the trees or the land base.

Benefits to the state

But while communities and regions benefit from this exogenous decision implemented by the state, the state likewise benefits. Again, it is not the intent of this thesis to provide a full list of benefits associated with higher education, other than to note that well-educated people are generally more healthy, more engaged politically and in their communities, and less likely to engage in criminal activity[368] – all reducing the need for high-cost responses from government. University graduates themselves not only receive the least in government transfers to individuals, they pay the most in taxes.[369] Perhaps this is not surprising when earnings are taken into account. In fact, Canadian university graduates make, on average, about twice as much per year as an individual with solely a high school diploma.[370] These higher wages translate into significant taxes on income over the entire working life of a university graduate. A study in England, for example, found that governments make significantly more from university graduates than it originally cost to educate them. The study, published in 2005, shows that a university graduate pays four times more in taxes over

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[367] Andersson et al., "University decentralization as regional policy: the Swedish experiment," 371.
[368] See Saunders, *Skills and Knowledge for Canada's Future: Seven Perspectives*, 3-4; Riddell, *The Impact of Education on Economic and Social Outcomes*, 7.
[369] Association of Universities and College of Canada, *Sustaining Economic Growth: Ensuring a Robust Tax Base for Future Generations*, 2.
[370] Statistics Canada, "Average earnings of the population 15 years and over by highest level of schooling, 2001," http://www40.statcan.ca/l01/cst01/labor50a.htm.

their working lives than the original government investment in educating him/her; an annual rate of return for government of more than 12%.[371]

Tax revenues aside, universities are seen to be critical components to the prosperity and global competitiveness of nations and provinces alike. In its *Advantage Canada* document, the Government of Canada states its goal to have the most highly educated labour force in the world.[372] Why? The answer is related to economic productivity. Within the next decade, Canada will see a decline in its workforce. If, as the AUCC suggests, increased education is required for increased labour force participation, exposing more people to a university education is a vital provincial and national productivity response.[373] This is especially true of the country's aboriginal population,[374] which is growing as a proportion of the population in northern regions across Canada. Providing greater opportunities for aboriginal people to access a university education and thereby enter the workforce in greater numbers was a primary motive behind the creation of UCN.[375] This response was necessary because the existing Manitoba universities have had little success with producing Aboriginal graduates. According to the most recent survey of Manitoba's university graduates, "Aboriginal people were under-represented at the bachelor level, and hardly represented at higher levels of

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[371] PriceWaterhouseCoopers, *The economic benefits of higher education qualifications*, 19.
[372] Canada, Department of Finance, "Advantage Canada: Building a Strong Economy for Canadians," 2006, http://www.fin.gc.ca/ec2006/plan/pltoce.html.
[373] Association of Universities and College of Canada, *Sustaining Economic Growth: Ensuring a Robust Tax Base for Future Generations*, 2-5.
[374] Mendelson, *Aboriginal Peoples and Postsecondary Education in Canada*, 1.
[375] Steve Ashton (Member of the Manitoba Legislative Assembly, Thompson Constituency), interview with the author, December 2005.

study."[376] In contrast, Aboriginal students made up 68% of the UCN enrolment in the 2004/05 academic year,[377] the year before it commenced university programming.

Evidence of a new social contract

The experience of Aboriginal people in Manitoba and the subsequent creation of UCN to address more of their educational needs is also evidence of a new social contract at work. Jean-Jacques Rousseau presents the social contract as an essential foundation for a civil society.[378] The root of the social contract is citizenship, which Rousseau defines as individuals putting their person and their power toward the common state in exchange for being part of the whole. This creates a "moral and collective body" that seeks to equalize opportunity for all citizens. While the terms of this contract may not be written, they are "tacitly accepted and acknowledged."[379]

Universities are part of a social contract, but descriptions of it are often limited to the connection between science, government, and industry. Vavakova, for example, describes the social contract between universities and society as a relationship between governments and scientists: government funds basic science and scientists promise that research is performed well and can be translated into new products, medicines, or weapons of value to the government.[380] Former University of Michigan president James Duderstadt agrees that national security influenced much of the major public investment in research throughout the

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[376] Statistics Canada, "National Graduates Survey: Manitoba graduates," *The Daily*, May 18, 2005, http://www.statcan.ca/Daily/English/050518/d050518e.htm
[377] Council on Post-Secondary Education, "Statistical Compendium Fall 2006," *Publications and Reports*, http://www.copse.mb.ca/en/documents/compendium2006/chapter_2.pdf.
[378] Gildin, *Rousseau's Social Contract*, 3.
[379] Rousseau, *On the Social Contract*, 24.
[380] Vavakova, "The new Social Contract between Governments, Universities, and Society: Has the Old One Failed?" 210.

20th century, but wonders if the "age of knowledge" will lead to a "new social contract that will determine the character of our educational institutions."[381] The creation of UNBC and UCN illustrate how these universities are part of a new social contract between communities (including Aboriginal communities), regions, and governments oriented to community sustainability. As Duderstadt suggests, "Just as with other resources such as food, energy, and transportation that soon become necessities of modern life and therefore the responsibility of a society, today higher education itself has become a similar need."[382] Forestry appurtenancy demonstrated the state's interest in preserving and strengthening communities. Today, UNBC and UCN provide their regions with a basic capacity for success that is already enjoyed by citizens in metropolitan centres.

The northern universities illustrate how the terms of the social contract have changed. When forestry appurtenancy was repealed in 2003, some claimed that it marked the end of the social contract between government and resource-based communities. A different perspective, however, would suggest that appurtenancy in its old guise was no longer sufficient for the sustainability of resource-based communities. UCN and UNBC represent a new social contract of a different type; one that includes universities as tools for enabling resource-based regions to participate in social, economic, and cultural opportunities enjoyed by other citizens. UNBC and UCN have objectives related to access, economic diversification, cultural revitalization, and community sustainability: all opportunities already present in metropolitan centres. As such, these northern universities seek to equalize opportunity for all citizens.

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[381] Duderstadt, "The Future of the University in an Age of Knowledge," 87.
[382] Ibid.

In Manitoba, the social contract is clearly linked to realizing the aspirations of the North's growing aboriginal population. In BC, the social contract involving UNBC is slightly different. While the aboriginal component is still significant, the tone of the social contract realized through the presence of UNBC is more oriented to economic sustainability and the region's ability to avoid a perpetual "brain drain" of educated/skilled people. Indeed, a speech by former UNBC President Jago to the North Central Municipal Association in 2004 focused on the revitalization of northern BC's economy through education and research. In it, a primary objective of UNBC is to help avoid the "devastating consequences" of population centralization in metropolitan centres.[383] This would require education and research on matters of direct and immediate consequence to the economy, as well as those many fields – teaching, nursing, medicine, etc. – that are vital to sustaining an acceptable quality of life, thereby enabling economic growth and the attraction of skilled personnel.

What would be an expected outcome of this new social contract centered around the presence of new universities in northern BC and northern Manitoba? Forestry appurtenancy led to population growth and the establishment of communities throughout rural British Columbia. However, it also entrenched a staples dependence in the region. Surely, an objective of the new social contract involving UNBC and UCN would be to stabilize and increase regional populations while entrenching a dependence on learning and innovation for economic diversification. The local placement of universities provides the best hope for enabling non-metropolitan regions to develop a culture of higher education while benefiting from a flow of

[383] Charles Jago, "Revitalizing Northern BC's Economy Through Education and Research" (speech, NCMA convention, Fort Nelson, BC, May 3, 2004).

ideas, people, and cultures. The spatial distribution of universities, however, is only one element; these universities must also be provided the teaching and research resources and tools that will enable them to succeed.[384] Doing so would have the effect of decentralizing knowledge-based economic growth away from a growing concentration in metropolitan centres.

Economic decentralization

Appurtenancy decentralized economic opportunities by favouring those activities located in close proximity to the resource itself – not those in close proximity to customers or metropolitan centres. Similarly, knowledge appurtenancy enables decentralization of economic activities that require education, ideas, skills, knowledge, research, and innovation. The ability of the two universities to access research funding has so far been limited to UNBC, and even though it attracts a small percentage of the provincial total, it is a new source of economic activity in a community/region that would otherwise have very limited opportunities for attracting research activity. In fact, the region's new ability to access health research funds – enabled by an increase in health science programs such as nursing and medicine, an anticipated cancer clinic, and the consolidation of regional health services in Prince George – has led to the identification of "Life Sciences" as a potential industry cluster in Prince George with significant export potential.[385]

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[384] Nock, "Lakehead University as a Hinterland Institution," 75-84.

[385] Meyers Norris Penny, "16-97 Alliance Cluster Initiative," 13-18. Often, the economic attributes of the life sciences pertain specifically to opportunities in biotechnology, pharmaceuticals, and medical diagnostics. These are often part of this sector in metropolitan centres. In comparison, the 16-97 report identifies life science opportunities specifically related to health and social service providers in the public sector that primarily service the local population. This has been identified as a potential cluster in north-central BC because of the large number of people employed in the sector and the potential for attracting additional research funding.

The fledgling high-technology industry has likewise benefited from the local presence of a university and college with computer science programming. The 2003 North-Central BC High-Tech Study showed that 172 companies contributed more than $133 million to the local economy and employed more than five hundred people in such sectors as networking, software, new media, and engineering.[386] About two-thirds of the companies had hired graduates of the local college and university and half were involved in research.[387] The capacity for research has been strengthened by UNBC's participation in BCNet, the provincial network connecting BC universities to other institutions across Canada and around the world. The network, being expanded in 2008 to a capacity equal to six thousand standard broadband internet connections, would not be serving Prince George (and local agencies such as Northern Health and the Public Library) if it was not for UNBC.

The extent to which UCN and UNBC are able to influence the nature of economic decentralization – especially over the short term – depends to some degree on the character of each institution. Are they scientific/technical universities with clear and immediate links to existing and emerging industries or are they more focused on programs in the humanities and social sciences that are connected to community services and the public sector? More broadly, are they institutions that focus on teaching or research, or both? UCN is weighted to educating workers for the public sector with a BA in Aboriginal and Northern Studies and other programming in Nursing, Education, and Social Work. UNBC is more mixed, with an active research profile in addition to education in a diverse range of professional programs, business, and the computing, physical, and environmental sciences. While programs in the

[386] Innovation Resource Centre, *2003 North-Central BC High-Tech Study*, 4-5.
[387] Ibid., 6.

sciences and business may be perceived to have a greater direct link to economic growth and diversification, degree programming and research in the human service sector (especially health and education) are important for providing the conditions necessary for local economic growth.

Economically inefficient

While the northern universities have expectations to be key agents in economic decentralization, they also require decentralization of the funding provided to universities. The operational budgets of the universities are primarily financed by two sources: students and the provincial governments, with the provincial grant representing the single largest source of income for both universities. Even though UCN and UNBC attract a small proportion of the total funding provided to universities in their respective provinces, their small size and northern locations represent an operational challenge. The reduced economy of scale compared to other universities is reminiscent of forestry appurtenancy, where technological change and global markets made small mills financially inefficient. The same is true for UCN and UNBC.

For UNBC, the extra cost of being small and geographically isolated originally earned it extra operating funds from the provincial government. Called the Northern Allowance, it provided a 25% premium on per-student operating funds compared to other universities. Although the Northern Allowance is no longer applied to funding for new initiatives, UNBC still benefits from its legacy. In the 2007-08 fiscal year, for example, UNBC received a larger operating grant per full-time equivalent student ($12,647) than UBC ($12,202), Simon Fraser

University ($9837), or the University of Victoria ($9634).[388] In Manitoba, UCN does not enjoy the benefit of an official funding formula that provides a northern premium. Instead, funding is routed through a Council on Post-Secondary Education, which makes allocations based on historic trends, the perceived needs of universities, and the requirements of program development/expansion.[389] According to the Council's 2005-06 annual report and Fall 2006 statistical compendium, UCN received provincial funding of $15,862 per full-time student, almost double the $8,015 the University of Manitoba received for each of its full-time students.[390] The higher level of provincial funding for UNBC and UCN reflect how the small size of the institutions, their remote locations, and distributed teaching sites all contribute to higher operating costs relative to larger universities in more central locations.

Restriction of access

The final aspect of appurtenancy that will be applied to the case studies presented in this thesis concerns a restriction to access. Both water and forestry appurtenancy restricted access to the resource to those who either had tenure (a forest company licensee) or whose property abutted a water body. At first, it would appear that this is the one characteristic of appurtenancy that does not seem to be applicable to the case studies. First, UCN and UNBC were created specifically to *increase* access, primarily among residents of their immediate region. Second, access is not limited to the immediate region. Rather, attracting new people,

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[388] The 2007-08 provincial grants are outlined in annual letters from the Ministry of Advanced Education. In addition to being provided to each institution, each of the 2007-08 budget letters is posted online: www.aved.gov.bc.ca/budget.

[389] Diane McGifford (Member of the Manitoba Legislative Assembly, Minister of Advanced Education and Literacy), interview with the author, December 2005.

[390] Operating grant information: Council on Post-Secondary Education, *2005-06 Annual Report*, 44. Enrolment figures for the University of Manitoba: Council on Post-Secondary Education, *2006 Statistical Compendium*, 15. Enrolment figures for the University College of the North: Council on Post-Secondary Education, *2006 Statistical Compendium*, 89.

ideas, agencies, and business to the northern regions represent important elements of the local benefits that each university brings. Third, the operating grants, research funds, and student populations at the other BC and Manitoba universities grew despite the creation of UCN and UNBC, indicating that government was not restricting access to other institutions in favour of the northern universities.

These factors notwithstanding, there are barriers that restrict access to UCN and UNBC. Like all universities, admission is limited to students who meet admission criteria and to those who can afford it, both in terms of the actual fees as well as the foregone potential earnings while in coursework. There are also barriers related to programming, hours of operation, culture, and expectations. Both UCN and UNBC are located in regions where university education has not been a normal extension of the education system. As a result, it is expected that a majority of students at both institutions are the first in their families to attend university.[391] Not only are these people less likely to attend university, those who do attend are less likely to succeed compared to those from families where at least one parent has obtained a university degree.[392]

Beyond these student barriers, there appear to be persistent barriers related to realizing the potential economic benefits of applied research and development. For example, the relative small size of UCN and UNBC limit the areas in which they can have a research profile. They are also both located in regions that may lack the capacity for absorbing the results of

[391] A survey of British Columbia university students in 2003 indicated that UNBC students were more than 60% less likely than the BC average to have parents who possess university degrees. See Dumaresq et al., "Study on University Accessibility and Affordability," 9, http://www.inst.uvic.ca/other/afford/full2004.pdf.
[392] Pike and Kuh, "First- and Second-Generation College Students," 276-277.

research, a problem that has also confronted northern universities in the Nordic countries.[393] In fact, this barrier has been cited as a primary example of how the application of the triple helix model is limited outside of metropolitan centres.[394] Tradition has also proven to be a barrier. For several decades, northern British Columbia and northern Manitoba have made significant economic contributions to their provinces through the extraction and export of resources. Until very recently, the regions themselves have lacked the capacity for research and development because they did not possess the requisite knowledge infrastructure. As a result, governments and industry have invested in research elsewhere (usually the metropolitan centres), even in the areas – forestry and mining, for example – where the northern regions would appear to have an advantage. While the addition of UNBC, in particular, has had the effect of decentralizing forestry research activity for example, most of the province's forestry research continues to take place in Vancouver and Victoria.[395] It remains to be seen if this will change in the future, or if governments and industry will continue to limit the ability of UNBC to participate in the research and innovation necessary for a sustainable forest industry that would clearly be of vital importance to the sustainability of the communities in its region. Research to date has included the development of a new concrete product using wood chips from trees killed by the mountain pine beetle, analysis of the bioenergy capabilities of wood, factors that affect tree growth in northern climates, and

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[393] Arbo and Eskelinen, "The Role of Small, Comprehensive Universities in Regional Economic Development: Examples from Two Nordic Cases," 34-42.

[394] Ibid.

[395] There are three primary examples of this: two from government and one from industry. **Provincial Government:** The 2007/08 Business Plan from the Government of British Columbia's Forest Science Program (a division of the Forest Investment Account) provided funding for 267 research projects around British Columbia that focus on sustainable forest management. UNBC received about 5% of the allocation, compared to 30% for UBC. http://www.for.gov.bc.ca/hcp/fia/FSP_Business_Plan_200708.pdf. **Federal Government**: The Canadian Forest Service has six administrative and research centres across Canada. The only one in British Columbia is located in Victoria and has more than 150 employees. http://cfs.nrcan.gc.ca/regions/pfc. **Industry:** Canfor operates 19 mills in northern BC, including four pulp mills. While its last operation in Metro Vancouver was permanently closed in January, 2008, the company's only research and development centre is located at UBC's Vancouver campus. http://www.canfor.com/company/operations/.

techniques for assessing and predicting the spread of forest pests.[396] UCN currently does not have a research profile, in part because of its young age.

Summary and Discussion

As previously described in chapter one, appurtenancy exhibited several geographic, political, and economic characteristics. These have also been evident in the establishment of UNBC and UCN:

1. Campuses in Prince George and Thompson (in addition to smaller campuses in regional centres) are illustrative of a spatial distribution of universities achieved by locating campuses in close **physical proximity to a clearly identified region**.
2. Governance and administrative structures were put in place to provide an element of **local management**.
3. This and other benefits were provided to the region even though **the region itself has no political jurisdiction** over the universities themselves.
4. The provincial government has the primary jurisdiction over universities (with the federal government being the primary source of research funding), indicating that the **policy responsibility is exogenous** from the regions themselves.

[396] The research on the pine beetle cement product was led by Ian Hartley and Ron Thring, in association with graduate student, Sorin Pasca. The prospect of using wood to produce ethanol has been researched by Steve Helle, an assistant professor in the Environmental Engineering program. The potential effects of climate change on tree growth have been studied by Forestry professor, Scott Green. The research on the dispersal of forest pests has been led by Environmental Science professor Peter Jackson and Brian Aukema, a Canadian Forest Service researcher based at UNBC's Prince George campus.

5. Whereas the local region benefits from the presence of the universities, **the state also benefits**, mainly through an increase in taxation and the creation of an educated and productive labour force.
6. UNBC and UCN are illustrative of a new **social contract** involving the universities as institutions created by the state. This social contract recognizes the value of resource-based communities (and their citizens) by providing them with some of the benefits and knowledge resources enjoyed by citizens in metropolitan areas.
7. These benefits include the potential for **decentralization of economic, social, and cultural activities** that are typically associated with the knowledge-based economy and otherwise centralized in big cities. Although there are some early examples of success, the evidence from both regions (especially, northern Manitoba) is limited because of the age of both institutions.
8. These economic benefits come at a price. The relative costs of operating UCN and UNBC – and, by extension, the operating grants provided by the provincial governments – are higher than the larger universities in the provinces and are illustrative of the northern universities' **relative economic inefficiency**.
9. While the universities were generally created to increase access to university among prospective students, **access is restricted** and barriers exist for maximizing the universities' educational and research activities. UCN, for example, has not yet been successful in obtaining any federal research funding, limiting the potential of the region to access the full range of activities that are normally associated with universities.

This summary illustrates how the establishment of UCN and UNBC provide evidence of the characteristics of appurtenancy. Ultimately, appurtenancy was government policy that created the conditions for sustainability in non-metropolitan regions. Does knowledge appurtenancy likewise create this capacity for sustainability? Given the emergence of a knowledge-based economy and the growing value of knowledge, research, innovation, and human capital to regional development, knowledge appurtenancy represents the best hope for community sustainability in resource-based regions.

It is the focus on community and regional sustainability that distinguishes knowledge appurtenancy from other models that describe the roles of universities in regional development. The Triple Helix model, for example, describes a complex and dynamic relationship between universities, government, and industry where each actor is equally important to regional economic development. This is a progressive assessment of the interaction between these actors and goes so far as to suggest that they are taking on the characteristics of each other. The application of the Triple Helix model to non-metropolitan universities and to the case study universities and regions in this thesis, however, is weak. For example, the Triple Helix is concerned with applied research for economic growth, not education, human capital development, cultural revitalization, or community sustainability. In fact, the participation of a defined region is not clearly identified within the model. Knowledge appurtenancy addresses this omission by essentially placing the region at the centre of the helix, giving context and focus to the important relationships between the university, industry, and government. Etzkowitz and Leydesdorff describe their Triple Helix

as a "model for analysing innovation in a knowledge-based economy."[397] Knowledge Appurtenancy is a model for enabling the sustainability of non-metropolitan regions in a knowledge-based economy.

The characteristics of appurtenancy enable this relationship to occur. Physical proximity within a defined region, local governance/management, and the renewal of the social contract all work to position the university as a valuable local/regional tool despite the fact the region has no actual political jurisdiction over the university. This sets the stage for a decentralization of economic activity outside of the metropolitan area and for benefits to flow both to the region and to the state as a whole. These benefits come at a price, however. For the state, the financial cost is high relative to larger universities in larger centres because of the inability of the northern universities to capture significant economies of scale, in terms of teaching, research, and general campus operations. The universities themselves also pay a price: the strong connection with the region that is illustrated by knowledge appurtenancy may be seen by some in academia to be restrictive or contrary to academic freedom. Clearly there would be the expectation in the relationship described above that UCN and UNBC would focus primarily on the needs and aspirations of the region, and the governments and industry operating within (or directly affecting) the region. This may have the effect of influencing university programming and research beyond that of the University's official governing bodies, its administration, and faculty.

Considering these costs, what is the pay-back? For the University, implementation of knowledge appurtenancy would provide it with regional status, political and financial

[397] Leydesdorff and Etzkowitz, "The Triple Helix as a Model for Innovation Studies," 198.

support, and a position as a leader in selected areas of academic focus that are of particular relevance to the community and region. The state would gain increased productivity from citizens who have traditionally experienced physical and cultural barriers in their ability to access higher education. The state would also acquire know-how on matters of provincial/national concern. Informed by research, the production of this knowledge would be vital to the sustainability of the social contract between governments and communities outside of the metropolitan regions. The actual task of applying this knowledge would fall to industry, business, and private/public sector agencies, both as employers of graduates as well as users of the applied research generated by the university. These broad connections are seen to be the most valuable contributions universities make to regional development in a knowledge-based economy,[398] over and above the specific kinds of interaction described in the triple helix model. All of these benefits would also be counted by the region and its communities, which would gain new opportunities for sustainability in an economy that increasingly places high value on human capital. The cost of *not* implementing knowledge appurtenancy would likely be a further widening of the educational, economic, demographic, and cultural gap between metropolitan and non-metropolitan regions of Canada and a further shrinking of the population outside of metropolitan centres.

Future Research

A growing gulf between Canada's metropolitan and non-metropolitan areas is not in the national interest, yet Canada has produced very little research on the future of non-metropolitan regions in the knowledge-based economy. The research that has been produced

[398] Florida, "Regions and Universities Together Can Foster a Creative Economy," NA.

tends to identify problems and challenges while the success stories typically come from big cities, either in Canada or elsewhere in the world:

- One of the first books on regionally based innovation systems in Canada does not even describe the role of territory[399] and most of the articles are written by European scholars on the theory of regional innovation systems and the European experience. The only case study is Kelowna, which has an economic structure that even the author admits is "closer to that of Vancouver," and not representative of the parts of British Columbia (or Canada) that are dependent on resource industries.[400]
- The *Canadian Journal of Regional Science* presented a special issue on the link between regional development, learning, and innovation, but the majority of the articles were written by Europeans or about Europe.[401] There was only one article about a Canadian region (rural Quebec).
- A rare journal article on the importance of innovation and knowledge to regional development in Canada's peripheral regions examines a community that is less than 100 kilometres away from Quebec City.[402] Another journal article about regional innovation systems in British Columbia focuses primarily on Vancouver.[403]

In summary, most of the research on this topic has a metropolitan spin and comes from the United States and Europe.[404] Perhaps it is a reflection of the relative size of European countries compared to Canada or the fact they have had a longer experience with northern

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[399] Shearmur, "Book Review of Innovations, Institutions and Territory: Regional Innovation Systems in Canada," 143.
[400] Adam Holbrook et al. "Innovation in Enterprises in a Non-Metropolitan Area: Quantitative and Qualitative Perspectives," in *Innovation, Institutions and Territory: Regional Innovation Systems in Canada*, ed. J. Adam Holbrook and David A. Wolfe (Montreal and Kingston: McGill-Queen's University Press, 2000), 142-143.
[401] *Canadian Journal of Regional Science*, vol. 24, #1 (Spring 2001).
[402] Doloreux, "Regional Innovation Systems in the Periphery: The Case of Beauce in Quebec (Canada)," 89.
[403] Goldberg, "Knowledge Creation, Use and Innovation: The Role of Urban and Regional Innovation Strategies and Policies," 641-660.
[404] Doloreux et al., "Learning and Innovation: Implications for Regional Policy," 5.

universities, but Europeans (especially Scandinavians) seem more practical in assessing the role of universities in regional development.

Canada's particular contribution to the topic could be focused on two elements of regional development that are normally presented dichotomously. First, modern presentations of regional development seem to favour *knowledge*-based over *resource*-based economies and that the process of development involves moving *from* a resource-based economy *to* a knowledge-based economy. Resource-based economies are often perceived as being primitive, but for Canadian society to ignore the nation's resource wealth would be tantamount to turning its back on one of its greatest global comparative advantages. Instead, Canada could become a leader in efforts to link environmental and community sustainability through the application of knowledge, innovation, and research to the resource sector. Given the growing gulf in understanding between urban citizens and the residents of resource-based communities, this application of knowledge to the environment and natural resources is perhaps best done in the regions where resource development is most directly linked to the livelihoods of citizens.[405] This would require active participation from the resource industry itself.

Second, what is the practical division between exogenous and endogenous factors in regional development? While the human capital created by universities is generally considered to be an endogenous input to regional development, the university is ultimately controlled and funded by governments and bureaucracies that are exogenous from the region itself. The

[405] McAllister, *Prospects for the Mineral Industry: Exploring Public Perceptions and Developing Political Agendas,* 18-20.

universities in northern Manitoba and northern British Columbia have greater potential to be endogenous forces for regional development than sawmills or mines, but the effects may take longer to be realized. In one of the only academic articles about UNBC published subsequent to its opening, founding President Geoffrey Weller contends that the University's potential is limited by the region itself and its willingness to make the University an integral part of future development strategies.[406] This would suggest that knowledge appurtenancy has not yet been fully realized in northern BC. How does a region take an exogenously created and funded institution and make it part of endogenous regional development efforts? Is endogenous regional development even possible in regions that are dependent on foreign markets for sales of resources? If not, is a "neo-endogenous" approach more realistic, where local areas merely attempt to steer external forces to the greatest local benefit?[407] How can universities enable regions to steer these external forces and how can higher education truly be embedded in a local economy?[408] What are the lessons from elsewhere that can be applied to northern BC and northern Manitoba? Alternatively, what are the lessons that can be learned from northern Manitoba and northern BC and what is the broader application to other northern and resource-based regions across Canada?[409] What is the relative effect of research funding in smaller, non-metropolitan universities? Regional distribution of research funds tends to be presented as the antithesis of building "world-class" research centres in a few cities.[410] It is reasonable to assume that researchers based at large, metropolitan institutes are more cost-efficient because of their economies of scale and equipment, yet it is equally

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[406] Weller, "The Impact of a New University in a Developing Region: The Case of the University of Northern British Columbia," 287.
[407] Ward et al., "Universities, the Knowledge Economy and 'Neo-Endogenous Rural Development.'" 5.
[408] Keane and Allison, "The Intersection of the Learning Region and Regional Economic Development," 896.
[409] For example, a feasibility study for a new university in northern Quebec is including a review of UNBC's history, programming, and research activity.
[410] Mason, "Research Stars Would Help Universities Shine," *The Globe and Mail*, A10," October 4, 2007.

probable that the applications of research are more likely in non-metropolitan areas where social networks (especially among elites) are tighter and universities are more locally connected.

These are not easy questions to answer, and Canada faces a particular challenge because of its regional diversity, complex division of political jurisdiction, sheer size, and the widening population, social, and economic gap between its metropolitan centres and the rest of the country. As Holbrook and Wolfe state in the introduction to their book on regional development in the knowledge-based economy, "Canada's ability to adapt its resource-based, traditional economy to more knowledge-intensive, technology-based activities will be critical for the maintenance of standard of living."[411] Knowledge appurtenancy is one response, formalizing the relationship between universities and resource-based regions as a vital element in providing these regions with the capacity for sustainability in a knowledge-based economy.

[411] Holbrook and Wolfe, "Introduction: Innovation Studies in a Regional Perspective," in *Innovation, Institutions and Territory: Regional Innovation Systems in Canada*, ed. J. Adam Holbrook and David A. Wolfe (Montreal and Kingston: McGill-Queen's University Press, 2000), 6.

Conclusion:

Knowledge Appurtenancy in the North

This thesis has presented knowledge appurtenancy as a policy option for enabling resource-based regions to participate in an increasingly knowledge-based economy. Universities have become vital regional development institutions and the creation of UCN and UNBC in Thompson and Prince George are illustrative of a reconceptualised notion of appurtenancy consistent with a modern understanding of the ingredients necessary for regional development.

The creation of UCN and UNBC do not, however, guarantee a bright future for Thompson and Prince George, or for their regions. While they have been successful in building a local knowledge infrastructure that will certainly be of value in the years ahead, their histories and challenges mirror countless other resource-based communities across Canada and around the world. The shared history is around dependence on natural resource extraction and the shared challenges include demographic change and population decline, a decrease in resource sector employment, difficulty in attracting and retaining highly skilled/educated personnel, and exposure to the ebbs and flows of global commodity prices that are beyond their control. Overcoming these challenges has been vexing for communities, governments, and scholars alike, as Morgan suggests:

> It is…in the context of less-favoured regions, where we encounter one of the biggest questions in political economy today. That is whether localized learning and innovation can be consciously induced through judicious public intervention and new forms of collective action. If less-favoured regions are to become something other than what they are today, especially if they are

> to develop a more robust endogenous capacity for innovation and development, they will need to [recognize the importance of local conditions, while realizing that local efforts are not alone sufficient for success]. [412]

The statement from Morgan is both a frustrating and profound summary of the literature on regional development in the knowledge-based economy. It identifies a number of vital issues:

1. Locally based institutions of learning and innovation matter
2. Places at the periphery are being challenged
3. Building greater endogenous capacity for regional development is desirable
4. The community/region has a vital role to play
5. Government policy and investment are necessary
6. The appropriate policy response is elusive

Knowledge appurtenancy is one such policy response, in large part because it is grounded in a realization that universities are vital to providing a capacity for sustainability. Arguably, it is in "less-favoured regions" where universities must be explicit in their regional relationships and responsibilities. Knowledge appurtenancy demonstrates this, while other models such as the Triple Helix, do not.

But while knowledge appurtenancy fairly describes the efforts to create universities in northern Manitoba and northern British Columbia, the implementation has fallen short. Neither university has fully realized its promise as tools for regional development in a

[412] Morgan, "The Exaggerated Death of Geography: Learning, Proximity, and Territorial Innovation Systems," 18.

knowledge-based economy. Weller would argue that the main reason for this shortcoming is that northern Canadian universities have simply not been created as part of comprehensive regional development plans.[413] This is true, but looking specifically at UCN and UNBC within the context of knowledge appurtenancy, there are other gaps. First, the dissolution of the UNBC Act officially terminated the University's regional mandate, subjecting this regional responsibility to a relatively young institutional culture and to the whims of administrators, faculty, governors, politicians, and donors. This is not to say that the connection between UNBC and its region is tenuous; only that it requires vigilance and a recognition that maintaining the relationship is both in the University's and the region's best interests. Second, the power of UCN as a "true" university is limited without a research profile. Its ability to engage with industry and other public/private-sector agencies cannot extend beyond that of a college or technical institute without the capacity to lead the discovery of new knowledge. Finally, no forum exists for actualizing and strengthening the relationships between the actors – the region and its communities, university, government, and industry – that comprise knowledge appurtenancy. As a result, communication between the actors can be fragmented and opportunities for regional development are missed. In particular, the university must embrace its responsibilities for community and regional engagement and not, as Weller expressed, blame the region for the lack of integration.[414] Despite these gaps, knowledge appurtenancy, as demonstrated through the creation of UNBC and UCN, represents a new policy option for resource-based, peripheral communities. This is not to say that every northern region should seek or be entitled to have its own university. Rather than being prescriptive, this thesis has sought to be descriptive in applying the

[413] Weller, "Universities in Northern Canada," 118-119.
[414] Weller, "The Impact of a New University in a Developing Region: The Case of the University of Northern British Columbia," 287.

experiences of northern Manitoba and northern British Columbia to broad questions related to how northern, resource-based regions can survive in the knowledge-based economy.

What would W.A.C. Bennett think? Would he see any other option for the northern parts of Canada? These regions have benefited from public and private investments, but these investments have largely been made with the primary motivation of extracting resource wealth; not building local capacity. If non-metropolitan regions are to continue to survive and contribute, they require a knowledge infrastructure that will enable them to participate in a knowledge-based economy. More than fifty years ago, Bennett stood on a hill and imagined prosperity for the North. He saw highways, dams, and schools. Appurtenancy was an important element in ensuring this vision was realized. Today, prosperity requires more endogenous capacity for knowledge and innovation that may be realized through a reconceptualised appurtenancy. In the same way that water and forestry appurtenancy provided the conditions necessary for regional sustainability during a resource-based economy, knowledge appurtenancy provides the capacity for regional sustainability in a knowledge-based economy.

Bibliography

Aga Khan Development Network. "University of Central Asia." http://www.akdn.org/uca/uca.htm.

Aghion, Philippe and Peter Howitt. *Endogenous Growth Theory*. Cambridge, Mass: MIT Press, 1998.

Alasia, Alessandro. *Skills, Innovation, and Growth: Key Issues for Rural and Territorial Development – A Survey of the Literature 1980-2003*. Ottawa: Statistics Canada (Catalogue no. 21-601-MIE 076), 2005.

Alasia, Alessandro and Erik Magnusson. "Occupational Skill Level: The Division Between Rural and Urban Canada." *Rural and Small Town Canada Analysis Bulletin* Vol 5, no. 6 (February 2005) Ottawa: Statistics Canada.

Andersson, Roland, John M. Quigley, and Mats Wilhelmson. "University Decentralization as Regional Policy: The Swedish Experiment." *Journal of Economic Geography* 4, no. 4 (2004): 371-388.

Apedaile, L. Peter. "The New Rural Economy." In *Building for Success: Exploration of Rural Community and Rural Development*, edited by Greg and Regine Halseth, 111-134. Brandon: Rural Development Institute, 2004.

Arbo, Peter and Paul Benneworth. "Understanding the Regional Contribution of Higher Education Institutions: A Literature Review." Education Working Paper No. 9, Directorate for Education, OECD, 2007. http://www.oecd.org/dataoecd/42/12/39874219.pdf.

Arbo, Peter, and Heikki Eskelinen. "The Role of Small, Comprehensive Universities in Regional Economic Development: Experiences from Two Nordic Cases." Conference presentation, *Peripheries, Centres, and Spatial Development in the New Europe*, Jyväskylä, Finland, August 27-30, 2003.

Arbo, Peter, and Narve Fulsås. "The University of Tromsø." In *Higher Education Across the Circumpolar North*, edited by Douglas C. Nord and Geoffrey R. Weller, 46-62. Houndmills, Great Britain: Palgrave MacMillan, 2002.

Arter, David. "Regionalization in the European Peripheries: The Cases of Northern Norway and Finnish Lapland." *Regional and Federal Studies* 11, no. 2 (2001): 94-114.

Arundel, Anthony, and Aldo Geuna. "Does Proximity Matter for Knowledge Transfer from Public Institutes and Universities to Firms?" Electronic Working Paper Series #73, Science and Technology Policy Research Unit, Brighton, UK, October 2001.

Association of Universities and Colleges of Canada. "Sustaining Economic Growth:

Ensuring a Robust Tax Base for Future Generations." Pre-budget brief submitted to the House of Commons Standing Committee on Finance. August 15, 2007. http://www.aucc.ca/_pdf/english/reports/2007/pre_budget_08_15_e.pdf.

Azmier, Jason J. and Lisa Lozanski. *Fighting the Odds: Rural Development Strategies for Western Canada*. Calgary: Canada West Foundation, 2004.

Baggen, Peter. "Knowledge Society and the Idea of the University." In *The University and the Knowledge Society*, edited by Peter Baggen, Agnes Tellings, and Wouter van Haaften, 87-104. Bemmel, NL: Concorde Publishing House, 1998.

Baldacchino, Godfrey. "Small Islands versus Big Cities: Lessons in the Political Economy of Regional Development from the World's Small Islands." *Journal of Technology Transfer* 31 (2006): 91-100.

Barnes, Trevor J. "Borderline Communities: Canadian Single Industry Towns, Staples, and Harold Innis." In *B/ordering SpaceRegions*, edited by H. Van Houtum, O. Kramsch, and W. Zierhofer, 109-22. Aldershot: Ashgate, 2005.

Baxter, David, Ryan Berlin, and Andrew Ramlo. *Regions and Resources: The Foundations of British Columbia's Economic Base*. Vancouver: Urban Futures Institute, 2005.

Bennett, Nelson. "Log Exports Create Jobs: Private Owners." *Nanaimo Daily News*. August 7, 2004.

Bercovitz, Janet and Maryann Feldman. "Entrepreneurial Universities and Technology Transfer: A Conceptual Framework for Understanding Knowledge-Based Economic Development." *Journal of Technology Transfer* 31 (2006): 175-188.

Bernsohn, Ken. *Cutting Up the North: The History of the Forest Industry in the Northern Interior*. Vancouver: Hancock House, 1981.

Beshiri, Roland, Ray Bollman, Neil Rothwell, and Robert Mendelson. "A Population Sketch of Rural and Small-town Canada." In *Building for Success: Exploration of Rural Community and Rural Development*, edited by Greg and Regine Halseth, 81-110. Brandon: Rural Development Institute, 2004.

Black, E. R. and A. C. Cairns. "A Different Perspective on Canadian Federalism." *Canadian Public Administration* 9, no. 1 (1966): 27-44.

Blouw, Max. "Impact of Higher Education on Regional Development." Presentation at the Association of Commonwealth Universities Benchmarking conference, Edith Cowan University, Perth, Australia, August, 2004

Bollman, Ray D. *Linkages Between Human Capital and Rural Development*. Brandon: Rural Development Institute, 1998.

Bone, Robert. "Population Change in the Provincial Norths." In *Geographic Perspectives on the Provincial Norths*, edited by Margaret E. Johnston, 87-109. Thunder Bay: Lakehead University Centre for Northern Studies, 1994.

Bone, Robert. *The Geography of the Canadian North: Issues and Challenges*. Toronto: Oxford University Press, 1992.

Boucher, Gerry, Cheryl Conway, and Els van der Meer. "Tiers of Engagement by Universities in Their Region's Development." *Regional Studies* 37, no. 9 (December 2003): 887-897.

Bowles, Paul, Jackie Lytle, and Sean Paterson. *The Weakest Link: Northern British Columbian Local Communities in the Global Forest Products Chain*. Report prepared for the Northern Land Use Institute, University of Northern British Columbia, October 2002.

Bowles, Roy T. "Single-Industry Resource Communities." In *Rural Sociology in Canada*, edited by D.A. Hay and G.S. Basran, 63-83. Toronto: Oxford University Press, 1992.

British Columbia. Legislative Assembly. *Official Report of Debates of the Legislative Assembly*, 8 May 2003.

British Columbia. Ministry of Forests. *Appurtenancy and Timber Processing Requirements and Mill Closures*. 2003? http://www.for.gov.bc.ca/hth/ForestRevitalization/documents/Processing%20background.doc.

British Columbia. Ministry of Forests. *The Forestry Revitalization Plan of the Government of BC*. March 2003.

British Columbia. Ministry of Lands, Forests, and Water Resources. *Pulpwood Harvesting Area No. 1*. 1962.

Business Council of British Columbia. "BC's Prosperity Is Still Closely Tied to the Resource Sector." *Policy Perspectives* 11, no. 4 (July 2004).

Byron, Ronald Neil. "Community Stability and Forest Policy in British Columbia." *Canadian Journal of Forest Research* 8, no. 1 (1978): 61-66.

Byron, Ronald Neil. "Community Sustainability and Regional Economic Development: The Role of Forest Policy in the North Central Interior of British Columbia." PhD diss., University of British Columbia, 1976.

Canada. Department of Finance. "Advantage Canada: Building a Strong Economy for Canadians." 2006. http://www.fin.gc.ca/ec2006/pdf/plane.pdf.

Canada. Natural Resources Canada. "Atlas of Canada: Resource-reliant Communities, 2001."

http://atlas.nrcan.gc.ca/site/english/maps/economic/rdc2001.

Canada. Natural Resources Canada. "The State of Canada's Forests 2002-2003." http://www.nrcan-rncan.gc.ca/cfs-scf/national/what-quoi/sof/sof03/views 02_e.html.

Canada Foundation for Innovation. "Funded Projects." http://www2.innovation.ca/pls/fci/fcienrep.base.

Canadian Institutes for Health Research. "CIHR's Funded Research Database" http://webapps.cihr-irsc.gc.ca/funding/Search?p_language=E&p_version=CIHR.

Charbonneau, Leo. "Crisis in Canada's Northern Research." *University Affairs*, November 2000.

Choe, Olivia. "Appurtenancy Reconceptualized: Managing Water in an Era of Scarcity." *Yale Law Journal* 113, no. 8 (2004): 1909-1953.

Coalition for Forest Solutions. "A New Social Contract." No date. http://www.forestsolutions.ca/PDF/ANewSocialCojc.pdf.

Coates, Ken and William Morrison. *The Forgotten North*. Toronto: James Lorimer and Company, 1992.

Coleman, James S. "Social Capital in the Creation of Human Capital." *The American Journal of Sociology* 94 (1998) S95-S120.

Cooke, Philip. "From Technopoles to Regional Innovation Systems: The Evolution of Localised Technology Development Policy." *Canadian Journal of Regional Science* 24, no. 1 (Spring 2001): 21-42.

Cooke, Philip. "Learning Regions: A Critique." Conference presentation, 4th European Meeting on Applied Evolutionary Economics, Utrecht, NL, May 19-21, 2005.

Cooke, Philip. "The Regional Development Agency in the Knowledge Economy: Boundary Crossing for Innovation Systems." Conference presentation, *Peripheries, Centres, and Spatial Development in the New Europe*, Jyväskylä, Finland, August 27-30, 2003.

Cooke, Philip. "Regional Innovation Systems, Clusters, and the Knowledge Economy." *Industrial and Corporate Change* 10, no. 4 (2001): 945-974.

Cooke, Philip, and Loet Leydesdorff. "Regional Development in the Knowledge-Based Economy: The Construction of Advantage." *Journal of Technology Transfer* 31 (2006): 5-15.

Cortright, Joseph. *New Growth Theory, Technology and Learning: A Practitioners Guide*. Portland: Impresa, 2001.

Council of Forest Industries. "Canada Lumber Production Softwood and Hardwood 1993-2005." *Forest Industry Statistics*. http://www.cofi.org/library_and_resources/statistics/documents/Canada_lumber_production.pdf.

Crocker, Robert and Alex Usher. *Innovation and Differentiation in Canada's Post-Secondary Institutions*. Ottawa: Canadian Policy Research Networks, June 2006. http://www.cprn.org/doc.cfm?doc=1472&l=en

Davenport, Paul. "Universities and the Knowledge Economy." *Ivey Business Journal* 65, no. 5 (May 2001): 64-69.

Davis, H. Craig, and Thomas H. Hutton. "The Two Economies of British Columbia." *BC Studies* 82 (Summer 1989): 3-15.

Delcourt, Greg, and Bill Wilson. "Forest Industry Employment: A Jurisdictional Comparison." *Canadian Public Policy* 24, no. 2 (1998): 11-25.

Dellert, Lois. "Sustained Yield: Why Has It Failed to Achieve Sustainability?" In *The Wealth of Forests: Markets, Regulation, and Sustainable Forestry*, edited by Chris Tollefson, 255-277. Vancouver: UBC Press, 1998.

Di Matteo, Livio. "Breakaway Country: The Isolated Residents of Northwestern Ontario are Tired of Life as a Resource Extraction Colony. One Option Would Be to Create a New Province – Mantario." *National Post.* Financial Post. September 6, 2006.

Doloreux, David. "Regional Innovation Systems in Canada: A Comparative Study." *Regional Studies* 38, no. 5 (July 2004): 481-494.

Doloreux, David. "Regional Innovation Systems in the Periphery: The Case of Beauce in Quebec (Canada)." *International Journal of Innovation Management* 7, no. 1 (March 2003): 67-94.

Doloreux, David, Richard Shearmur, and Pierre Filion. "Learning and Innovation: Implications for Regional Policy. An Introduction." *Canadian Journal of Regional Science* 24, no. 1 (Spring 2001): 5-15.

Doutriaux, Jerome. "Private Sector-Financed Research Activities at Canadian Universities: Distribution and Recent Trends." In *Innovation, Institutions, and Territory: Regional Innovation Systems in Canada,* edited by J. Adam Holbrook and David A. Wolfe, 93-123. Montreal and Kingston: McGill-Queen's University Press, 2000.

Drache, Daniel. "Celebrating Innis: The Man, the Legacy, and Our Future – Introduction." In *Staples, Markets, and Cultural Change*, edited by Daniel Drache, xiii-lix. Montreal and Kingston: McGill-Queen's University Press, 1995.

Drushka, Ken. "Forest Ownership and the Case for Diversification." In *Touch Wood: BC Forests at the Crossroads*, edited by Ken Drushka, Bob Nixon, and Ray Travers, 1-22. Madeira Park, BC: Harbour Publishing, 1993.

Duderstadt, James J. "The Future of the University in an Age of Knowledge." *Journal of Asynchronous Learning Networks* 1, no. 2 (August 1997): 78-88.

Dumaresq, Cheryl, Ashley Lambert-Maberly, Walter Sudmant, Tony Eder, and Cheryl Sivertson. "Study on University Accessibility and Affordability." Statistical document. University of British Columbia and University of Vicoria. 2004? http://www.inst.uvic.ca/other/afford/full2004.pdf

Etzkowitz, Henry. "Innovation: The Endless Transition." Conference presentation, *Weathering the Storm or Reaping the Harvest: Universities and the Innovation Agenda*, Saskatoon, Saskatchewan, November 10, 2005.

Etzkowitz, Henry. "The Triple Helix of University – Industry – Government: Implications for Policy and Evaluation." Working paper 2002-11, Institutet för Studier av Utbildning och Forskning, Stockholm, 2002.

Etzkowitz, Henry, Andrew Webster, Christiane Gebhardt, and Branca Regina Cantisano Terra. "The Future of the University and the University of the Future: Evolution of Ivory Tower to Entrepreneurial Paradigm." *Research Policy* 29 (2000): 313-300.

Fasken Martineau DuMoulin LLP. *Forestry Bulletin: British Columbia's New Forestry Legislation.* April 2003.

Feldman, Maryann, Barak S. Aharonson, and Joel A.C. Baum. "The Importance of Proximity and Location." Presentation, *Advancing Knowledge and the Knowledge Economy* conference of the National Academies, Washington, DC, January 10, 2005.

Florida, Richard. "Regions and Universities Together Can Foster a Creative Economy." *The Chronicle of Higher Education* 53, no. 4 (Sept 15, 2006): NA.

Forrant, Robert, Jean L. Pyle, William Lazonick, and Charles Levenstein, eds. *Approaches to Sustainable Development: The Public University in the Regional Economy.* Amherst, Mass.: University of Massachusetts Press, 2001.

Freshwater, David. "Delusions of Grandeur: The Search for the Vibrant Rural America." In *Building for Success: Exploration of Rural Community and Rural Development*, edited by Greg and Regine Halseth, 29-50. Brandon: Rural Development Institute, 2004.

Gault, Fred. "Measuring Knowledge and its Economic Effects: The Role of Official Statistics." Presentation, *Advancing Knowledge and the Knowledge Economy* conference of the National Academies, Washington, DC, January 10, 2005.

Gibbons, Michael, Camille Limoges, Helga Nowotny, Simon Schwartzman, Peter Scott, and Martin Trow. *The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies*. London: Sage Publications, 1994.

Gildin, Hilail. *Rousseau's Social Contract: The Design of the Argument*. Chicago: University of Chicago Press, 1983.

Gill, Alison M., and Geoffrey C. Smith. "Residents' Evaluative Structures of Northern Manitoba Mining Communities." *The Canadian Geographer* 29 (1985): 17-29.

Glasson, John. "The Widening Local and Regional Development Impacts of the Modern Universities – A Tale of Two Cities (and North-South Perspectives)." *Local Economy* 18, no. 1 (February 2003): 21-37.

Goddard, John. "The Engagement of Higher Educational Institutions in Regional Development: An Overview of the Opportunities and Challenges." Presentation, OECD/IMHE International Conference, Valencia, Spain, September 19-21, 2007.

Goddard, John. "Universities and Regional Development: An Overview." OECD, July 1997. http://www.oecd.org/dataoecd/53/6/40033173.pdf.

Godin, Benoit. "The Knowledge-Based Economy: Conceptual Framework or Buzzword?" *Journal of Technology Transfer* 31 (2006): 17-30.

Goldberg, Michael A. "Knowledge Creation, Use and Innovation: The Role of Urban and Regional Innovation Strategies and Policies." *European Planning Studies* 14, no. 5 (June 2006): 641-664.

Goldstein, Harvey A. and Catherine S. Renault. "Contributions of Universities to Regional Economic Development: A Quasi-Experimental Approach." *Regional Studies* 38, no. 7 (October 2004): 733-746.

Green, Tom. *Cutting for the Economy's Sake: Setting Timber Harvest Levels That Are Good for British Columbia's Economy*. Victoria: Sierra Club of British Columbia, 2000.

Gunasekara, Chrys. "Reframing the Role of Universities in the Development of Regional Innovation Systems." *Journal of Technology Transfer* 31 (2006): 101-113.

Gunton, Thomas. "Natural Resources and Regional Development: An Assessment of Dependency and Comparative Advantage Paradigms." *Economic Geography* 79, no. 1 (January 2003): 67-94.

Haley, David and Martin Luckert. "Tenures as Economic Instruments for Achieving Objectives of Public Forest Policy in British Columbia." In *The Wealth of Forests: Markets, Regulation, and Sustainable Forestry*, edited by Chris Tollefson, 123-151. Vancouver: UBC Press, 1998.

Halseth, Greg. "Introduction." In *Prince George: A Social Geography of B.C.'s Northern Capital*, edited by Greg and Regine Halseth, 5-12. Prince George: UNBC Press, 1998.

Halseth, Greg, Donald Manson, Sean Markey, Leslie Lax, and Onkar Buttar. "The Connected North: Findings from the Northern B.C. Economic Vision and Strategy Project." *Journal of Rural and Community Development* 3 (2006): 1-27.

Halseth, G., D. Straussfogel, S. Parsons and A. Wishart. "Regional Economic Shifts in British Columbia: Speculation from Recent Demographic Evidence." *Canadian Journal of Regional Science* 27, no. 2 (Autumn 2004): 317-352.

Hanlon, Neil and Greg Halseth. "The Greying of Resource Communities in Northern British Columbia: Implications for Health Care Delivery in Already Under-serviced Communities." *The Canadian Geographer* 49, no. 1 (2005): 1-24.

Harloe, Michael and Beth Perry. "Universities, Localities, and Regional Development: The Emergence of the 'Mode 2' University?" *International Journal of Urban and Regional Research* 28, no. 1 (March 2004): 212-223.

Harris, Roger. "Update on Forestry Revitalization." Keynote address, Forest Expo, Prince George, BC, June 4, 2004.

Hayter, Roger and Trevor J. Barnes. "Troubles in the Rainforest: British Columbia's Forest Economy in Transition." In *Troubles in the Rainforest: British Columbia's Forest Economy in Transition*, edited by R. Hayter and T.J. Barnes, 1-11. Victoria: Western Geographical Press, 1997.

Hayter, Roger and Trevor J. Barnes. "The Restructuring of British Columbia's Coastal Forest Sector: Flexibility Perspectives." In *Troubles in the Rainforest: British Columbia's Forest Economy in Transition*, edited by R. Hayter and T.J. Barnes, 181-203. Victoria: Western Geographical Press, 1997.

Hayter, Roger, Trevor J. Barnes, and Michael J. Bradshaw. "Relocating Resource Peripheries to the Core of Economic Geography's Theorizing: Rationale and Agenda." *Area* 35, no. 1 (2003), 15-23.

Heritage North Museum. "Welcome to Thompson, Cross Lake, Churchill, Leaf Rapids, and Lynn Lake 2005." Brochure. Heritage North Museum: Thompson, 2005.

Hirsch, Todd. *Toward a Bright Future: Recommendations for Addressing Skills Shortages in Western Canada*. Calgary: Canada West Foundation, 2005.

Holbrook, J. Adam, Tim Padmore, and Lindsay Hughes. "Innovation in Enterprises in a Non-Metropolitan Area: Quantitative and Qualitative Perspectives." In *Innovation, Institutions, and Territory: Regional Innovation Systems in Canada,* edited by J. Adam Holbrook and David A. Wolfe, 139-162. Montreal and Kingston: McGill-Queen's University Press, 2000.

Holbrook, J. Adam, and David A. Wolfe. "Introduction: Innovation Systems in a Regional Perspective." In *Innovation, Institutions, and Territory: Regional Innovation Systems in Canada,* edited by J. Adam Holbrook and David A. Wolfe, 1-15. Montreal and Kingston: McGill-Queen's University Press, 2000.

Houghton, John, and Peter Sheehan. *A Primer on the Knowledge Economy*. Melbourne: Centre for Strategic Economic Studies, Victoria University, 2000. http://www.cfses.com/documents/knowledgeeconprimer.pdf

Howard, Ann. *The Origins of the College of New Caledonia: CNC Commemorative History Series*. Prince George: College of New Caledonia, 1988.

Howlett, Michael, and Keith Brownsey. "From Timber to Tourism: The Political Economy of British Columbia." In *Politics, Policy, and Government in British Columbia*, edited by R.K. Carty, page numbers. Vancouver: UBC Press, 1996.

Hudson, Christine. "The University and Regional Reciprocity." Working Paper 18, CERUM, University of Umeå, Sweden, 2000.

Hutton, Thomas. *British Columbia at the Crossroads: New Regional Development Pathways for the 21st Century*. Vancouver: BC Progress Board, 2002.

Ibbotson, John. "A Bleak Choice for Young Indians." *Globe and Mail*, August 3, 2006.

Inco. "Inco Reports Record Earnings for Third Quarter 2006," News release, 20 October 2006. http://www.inco.com/newscentre/newsreleases/Default.aspx?posting_id=3888

Inco. "The Nickel Growers." Brochure. No date.

Innis, Harold A. "The Importance of Staple Products in Canadian Development." In *Staples, Markets, and Cultural Change*, edited by Daniel Drache, 3-23. Montreal and Kingston: McGill-Queen's University Press, 1995.

Innovation Resource Centre. *2003 North-Central BC High Technology Study*. Prince George: Innovation Resource Centre, 2003. http://www.innovate.bc.ca/irc/miscfiles/hightechstudy2003.pdf.

Isaksen, Arne. "Building Regional Innovation Systems: Is Endogenous Industrial Development Possible in the Global Economy?" *Canadian Journal of Regional Science* 24, no. 1 (Spring 2001): 101-124.

Jackson, Tony and John Curry. "Community-based Sustainability in an Export Dependent Natural Resource Economy: the British Columbian Experiment to Deliver 'Sustainability in One Province.'" *Transatlantic Studies* 2 no.1 (2004), 39-59.

Jackson, Tony and John Curry. "Forest Renewal British Columbia: An Experiment in the

Recycling of Revenue-raising Environmental Taxation." *Journal of Environmental Planning and Management* 45, no. 4 (2002): 591-606.

Jackson, Tony and John Curry. "Regional Development and Land Use Planning in Rural British Columbia: Peace in the Woods?" *Regional Studies* 36, no. 4 (2002): 439-443.

Jago, Charles. Presentation at the Health Care Rally, Prince George, BC, June 22, 2000.

Jago, Charles. "Revitalizing Northern BC's Economy Through Education and Research." Presentation at the North Central Municipal Association annual convention, Fort Nelson, BC, May 13, 2004.

Johnston, Margaret E. "The Provincial Norths and Geographic Study." In *Geographic Perspectives on the Provincial Norths*, edited by Margaret E. Johnston, 1-15. Thunder Bay: Lakehead University Centre for Northern Studies, 1994.

Keane, Julie, and Janelle Allison. "The Intersection of the Learning Region and Local and Regional Economic Development: Analyzing the Role of Higher Education." *Regional Studies* 33, no. 9 (December 1999): 896-902.

Kosonen, Kati-Jasmin. "Linking Less-Favoured Regions to the Knowledge Economy – Finnish Experiences." Presentation, Regional Studies Association International Conference, University of Aalborg, Denmark, May 28-31, 2005.

Kracman, David. "Liquid Capital: Water Marketing in the Twenty-First Century." May 23, 2001. http://www.ce.utexas.edu/prof/mckinney/ce397/Topics/WaterMarketing/Kracman-WaterMarketing.pdf.

Kuyek, Joan, and Catherine Coumans. *No Rock Unturned: Revitalizing the Economies of Mining Dependent Communities*. Ottawa: Mining Watch Canada, 2003.

Laidler, David. "Renovating the Ivory Tower: An Introductory Essay." In *Renovating the Ivory Tower: Canadian Universities and the Knowledge Economy*, edited by David Laidler, 1-38. Toronto: C.D. Howe Institute, 2002.

Lamarche, Rodolphe H. *Capitalizing on the Information Economy: A New Approach in Regional Development*. Moncton: Canadian Institute for Research on Regional Development, 1990.

Lee, Marc. *BC's Social Contract is Being Dismantled in Revolutionary Ways*. Vancouver: Canadian Centre for Policy Alternatives, December 2003.

Lee, Marc. *Bleeding the Hinterland: A Regional Analysis of British Columbia's Tax and Spending Cuts*. Vancouver: Canadian Centre for Policy Alternatives, 2003.

Lee, Marc, Stuart Murray, and Ben Parfitt. *British Columbia's Regional Divide: How Tax*

and Spending Policies Affect BC Communities. Vancouver: Canadian Centre for Policy Alternatives, May 2005.

Lee, Terence R., and Andrei S. Jouravlev. *Prices, Property, and Markets in Water Allocation.* Santiago, Chile: United Nations Economic Commission for Latin America and the Caribbean, 1998.

Leydesdorff, Loet. "'While a Storm is Raging on the Open Sea': Regional Development in a Knowledge-Based Economy." *Journal of Technology Transfer* 31 (2006): 189-203.

Leydesdorff, Loet, and Henry Etzkowitz. "The Triple Helix as a Model for Innovation Studies." *Science and Public Policy* 25, no. 3 (1998): 195-203.

Lucas, Rex A. *Minetown, Milltown, Railtown: Life in Canadian Communities of Single Industry.* Toronto: University of Toronto Press, 1971.

Lundvall, Bengt-Åke. "The University in the Learning Economy." Working Paper #02-06, Danish Research Institute for Industrial Dynamics, Aarhus, Denmark, 2002.

Lundvall, Bengt-Åke. *"Why the New Economy is a Learning Economy."* Working Paper #04-01, Danish Research Institute for Industrial Dynamics Aarhus, Denmark, 2004.

Magnusson, Erik, and Alessandro Alasia. *Occupational Patterns within Industry Groups: A Rural-Urban Comparison.* Rural and Small Town Canada Analysis Bulletin, Vol 5, no. 6 (November 2004) Ottawa: Statistics Canada.

Manitoba. Bill 20. *University College of the North Act*, 2nd sess., 38th Legislature, 2004 (assented to 10 June 2004).

Manitoba. Consultation on Post-Secondary Education in Northern Manitoba. *University College of the North: Recommendations and Action Plan.* March 2003. http://www.ucn.mb.ca/UCNIT/documents/UCN_recommendations_actionplan.pdf.

Manitoba. Council on Post-Secondary Education. "2006 Statistical Compendium: For the Academic Years Ending in 2005." http://www.copse.mb.ca/en/publications/index.html.

Manitoba. Council on Post-Secondary Education. "Annual Report 2005-06." http://www.copse.mb.ca/en/documents/reports/an_rpt_copse_0506_en.pdf.

Manitoba. Post-Secondary Education Council Steering Committee. *University College of the North: A Vision for Our Future.* September 2000. http://www.ucn.ca/UCN/dpcs/UCN%20Proposal.pdf.

Manitoba. "Province Plans University College of the North Campus for Thompson." News Release, March 13, 2007. http://news.gov.mb.ca/news/index.html?archive=2007-3-01&item=1336.

Manitoba. University College of the North Implementation Team. *Overview of Post-Secondary Education in Northern Manitoba: The Past Forty Years*. No date. http://www.ucn.mb.ca/UCNIT/post-sec/overview.html.

Manitoba. University Education Review Committee. *Doing Things Differently: Report of the University Education Review Committee.* December 1993. http://www.gov.mb.ca/educate/postsec/roblin/roblin.html.

Marchak, M. Patricia. *Green Gold: The Forest Industry in British Columbia*. Vancouver: UBC Press, 1983.

Marchak, M. Patricia, Scott L. Aycock, and Deborah M. Herbert. *Falldown: Forest Policy in British Columbia*. Vancouver: David Suzuki Foundation and Ecotrust Canada, 1999.

Markey, Sean, Greg Halseth, Donald Manson. "The Struggle to Compete: From Comparative to Competitive Advantage in Northern British Columbia." *International Planning Studies* 11, no. 1 (February 2006): 19-39.

Mason, Gary. "Research Stars Would Help Universities Shine." *The Globe and Mail*, October 4, 2007.

McAllister, Mary Louise. "Prospects for the Mineral Industry: Exploring Public Perceptions and Developing Political Agendas." Working Paper #50, Centre for Resource Studies, Queen's University, Kingston, 1992.

McAllister, Mary Louise. "A Stake in the North: Prospects for Employment in Mining Towns," in *A Stake in the North: Papers on Mining, Forestry, and Remote Tourism Employment*, edited by Ray D. Bollman,1-8. Brandon: Canadian Rural Restructuring Foundation, 1997.

McAllister, Mary Louise, and Cynthia Jacqueline Alexander. *A Stake in the Future: Redefining the Canadian Mineral Industry.* Vancouver: UBC Press, 1997.

McBride, Stephen, Sharon McKay, and Mary Ellen Hill. "Unemployment in a Northern Hinterland: The Social Impact of Political Neglect." In *Provincial Hinterland: Social Inequality in Northwestern Ontario*, edited by Chris Southcott, 29-42. Halifax: Fernwood Publishing, 1993.

McCaffray, Charles J. *UNBC – A Northern Crusade: The How and Who of B.C.'s Northern U.* Victoria: Morriss Printing Ltd., 1995.

Mehta, Michael D. "Regulating Biotechnology and Nanotechnology in Canada: A Post-Normal Science Approach for Inclusion of the Fourth Helix." Presentation, International Workshop on Science, Technology and Society, National University of Singapore, April 19, 2002.

Mendelson, Michael. *Aboriginal Peoples and Postsecondary Education in Canada.* Ottawa: Caledon Institute, July 2006.

Meyers Norris Penny. "16-97 Alliance Cluster Initiative." Prince George, 16-97 Economic Alliance, January 2008. http://www.1697economicalliance.ca/downloads/Executive%20Summary%2010Jan2008-final.pdf.

M'Gonigle, Michael. "Living Communities in a Living Forest: Towards an Ecosystem-Based Structure of Local Tenure and Management." In *The Wealth of Forests: Markets, Regulation, and Sustainable Forestry*, edited by Chris Tollefson, 152-185. Vancouver: UBC Press, 1998.

M'Gonigle, Michael. "Structural Instruments and Sustainable Forests: A Political Economy Approach." In *The Wealth of Forests: Markets, Regulation, and Sustainable Forestry*, edited by Chris Tollefson, 102-119. Vancouver: UBC Press, 1998.

M'Gonigle, Michael and Ben Parfitt. *Forestopia.* Madeira Park, BC: Harbour Publishing, 1994.

Michie, Jonathan, and Christine Oughton. "Regional Innovation Strategies: Integrating Regional, Industrial, and Innovation Policy." *New Economy* 8, no. 3 (2001): 164-169.

Mitchell, David J. *W.A.C. Bennett and the Rise of British Columbia.* Vancouver: Douglas & McIntyre, 1983.

Morgan, Kevin. "The Exaggerated Death of Geography: Learning, Proximity, and Territorial Innovation Systems." *Journal of Economic Geography* 4, no. 1 (2004): 3-21.

Morgan, Kevin. "The Learning Region: Institutions, Innovation and Regional Renewal." *Regional Studies* 31, no. 5 (1997): 491-503.

Muirhead, Bruce, Stephen McBride, and Kjell Lundmark. *Politics Versus Markets: Employment Strategies in Peripheral Regions.* Thunder Bay: Lakehead University Centre for Northern Studies, report 27, 1991.

Nagle, George Shorten. "Economics and Public Policy in the Forestry Sector of British Columbia." PhD diss., Yale University, 1970.

Natural Sciences and Engineering Research Council of Canada. "Awards Search Engine (1996-2006)." http://www.outil.ost.uqam.ca/CRSNG/Outil.aspx?Langue=Anglais.

New Democratic Party Caucus of Manitoba. "Sustaining Communities in the North." No date. http://www.ndpcaucus.mb.ca/?q=node/45.

Newlands, David. "The Role of Universities in Learning Regions." Conference presentation,

Peripheries, Centres, and Spatial Development in the New Europe, Jyväskylä, Finland, August 27-30, 2003.

Nilsson, Jan Evert, Peter Arbo, Morten S. Dahl, Bent Dahlum, Ingi Runar Edvardsson, Heikki Eskelinen, Kent Nielsen, Åke Uhlin, and Håkan Ylinenpää. *The Role of Universities in Regional Innovation Systems – A Nordic Perspective*. Copenhagen: Copenhagen Business School Press, 2006. http://www.bth.se/tks/ctup.nsf/(webFiles)/3EDA909A7F1CCDAAC1256F4AOO5CDO26/$FILE/RegionalInnoSyst.pdf.

Niosi, Jorge. "Success Factors in Canadian Academic Spin-Offs." Conference presentation, *Weathering the Storm or Reaping the Harvest: Universities and the Innovation Agenda*, Saskatoon, Saskatchewan, November 10, 2005.

Nock, David. "Lakehead University as a Hinterland Institution." In *Provincial Hinterland: Social Inequality in Northwestern Ontario*, edited by Chris Southcott, 75-88. Halifax: Fernwood Publishing, 1993.

Nord, Douglas C. "The Role of Universities in Northern Development: A Comparative Perspective." In *Higher Education Across the Circumpolar North*, edited by Douglas C. Nord and Geoffrey R. Weller, 175-194. Houndmills, Great Britain: Palgrave MacMillan, 2002.

OECD. *The Knowledge-Based Economy*. Paris: OECD, 1996.

OECD. *Regional Problems and Policies in Canada*. Paris: OECD, 1994.

OECD. *The Response of Higher Education Institutions to Regional Needs*. Paris: OECD, 1999.

"Old Economy v. New Economy: How Production and Jobs are Changing." *Globe and Mail*, April 27, 2006: B8.

Parboosingh, Jean. "Medical Schools' Social Contract: More than Just Education and Research." *Canadian Medical Association Journal* 168, no. 7 (April 2003): 852-853.

Parfitt, Ben. *Getting More From Our Forests: Ten Proposals for Building Stability in BC's Forestry Communities*. Vancouver: Canadian Centre for Policy Alternatives, 2005.

Pearse, Peter H. "Economic Instruments for Promoting Sustainable Forestry: Opportunities and Constraints." In *The Wealth of Forests: Markets, Regulation, and Sustainable Forestry*, edited by Chris Tollefson, 19-41. Vancouver: UBC Press, 1998.

Pearse, Peter H. "Natural Resource Policies in British Columbia: An Economist's Critique." In *Exploiting Our Economic Potential: Public Policy and the British Columbia Economy*, edited by R. Shearer, 45-60. Toronto: Holt, Rinehart, and Winston of Canada, 1968.

Perry, G. Neil. "The Political Economy of Education." In *Exploiting Our Economic Potential: Public Policy and the British Columbia Economy*, edited by R. Shearer, 79-113. Toronto: Holt, Rinehart, and Winston of Canada, 1968.

Pike, Gary R., and George D. Kuh. "First- and Second-Generation College Students: A Comparison of Their Engagement and Intellectual Development." *The Journal of Higher Education* 76, no. 3 (May/June 2005): 276-300.

Polèse, Mario and Richard Shearmur. "How Can We Halt the Demise of Canada's Peripheral Regions?" *Policy Options*, May 2003: 47-52.

Polèse, Mario and Richard Shearmur. *The Periphery in the Knowledge Economy: The Spatial Dynamics of the Canadian Economy and the Future of Non-Metropolitan Regions in Quebec and the Atlantic Provinces.* Montreal: Canadian Institute for Research on Regional Development, 2002.

Powell, Walter W., and Kaisa Snellman. "The Knowledge Economy." *Annual Review of Sociology* 30 (2004) 199-220.

Pretes, Michael and Michael Robinson. *Beyond Boom and Bust: A Strategy for Creating Sustainable Development in the North.* Calgary: Arctic Institute of North America, 1988.

Price Waterhouse. *Prince George Timber Supply Area: Economic Value of the Forest Industry*. Prince George?: Price Waterhouse, October 1994.

PriceWaterhouseCoopers. "The Economic Benefits of Higher Education Qualifications: A Report Produced for The Royal Society of Chemistry and the Institute of Physics." January 2005. http://www.rsc.org/images/EconomicBenefitsHigherEducationQualifications_tcm18-12647.pdf.

Randall, James E. and R. Geoff Ironside. "Communities on the Edge: An Economic Geography of Resource-Dependent Communities in Canada." *The Canadian Geographer* 40, no. 1 (1996): 17-35.

Ray, Christopher. "Endogenous Socio-Economic Development and Trustful Relationships: Partnerships, Social Capital and Human Agency." Working Paper 45, Centre for Rural Economy, University of Newcastle Upon Tyne, January 2000. http://www.ncl.ac.uk/cre/publish/pdfs/wp45a.pdf.

Rea, Kenneth J. *The Political Economy of Northern Development*. Ottawa: Science Council of Canada, 1976.

Reed, Maureen G. "Local Politics in the Provincial Norths: Struggles in Resource

Management and Economic Development." In *Geographic Perspectives on the Provincial Norths*, edited by Margaret E. Johnston, 224-255. Thunder Bay: Lakehead University Centre for Northern Studies, 1994.

Rennie, Brannon, and Greg Halseth. "Employment in Prince George." In *Prince George: A Social Geography of B.C.'s Northern Capital*, edited by Greg and Regine Halseth, 45-66. Prince George: UNBC Press, 1998.

Riddell, W. Craig. *The Impact of Education on Economic and Social Outcomes: An Overview of Recent Advances in Economics*. Ottawa: Canadian Policy Research Networks, 2006. http://www.cprn.org/documents/44362_en.pdf.

Robson, Robert. *Forest Dependent Communities in Canada: An Interpretative Overview and Annotated Bibliography.* Brandon: Rural Development Institute, 1995.

Rousseau, Jean-Jacques. *On the Social Contract: Discourse on the Origin of Inequality.* Translated by Donald A. Cress. Indianapolis: Hackett Publishing Company, 1983.

Salo, Matti. "Pohjoinen Alma Mater [Alma Mater of the North: Role of the University of Oulu in Higher Education and in Society]." PhD diss., University of Oulu, 2000.

Saarivirta, Toni and Davide Consoli. "Regional Development, Education, and Innovation: A Case Study on University Graduates in Finland." Conference presentation, 10th summer conference of the Danish Research Unit for Industrial Dynamics, Copenhagen, DK, June 27-29, 2005.

Saunders, Doug. "Why City Mice Ship Cheese to Country Mice." Reckoning. *The Globe and Mail*, April 24, 2004.

Saunders, Ron. *Skills and Knowledge for Canada's Future: Seven Perspectives*. Ottawa: Canadian Policy Research Networks, 2006. http://www.cprn.org/documents/44360_en.pdf.

Savoie, Donald J. "Defining Regional Disparities." In *The Canadian Economy: A Regional Perspective*, edited by Donald J. Savoie, 165-189. Toronto: Methuen Publications, 1986.

Savoie, Donald J. *Rethinking Canada's Regional Development Policy: An Atlantic Perspective.* Moncton: The Canadian Institute for Research on Regional Development, 1997.

Scoffield, Heather. "Invest in Higher Education to Get Innovative Ideas Flowing." *Globe and Mail*, April 28, 2006: B7.

Scoffield, Heather, Gordon Pitts, Greg Keenan. "At the Crossroads: Adapt or Perish." *Globe and Mail*, April 27, 2006: B8.

Scott, Peter. "Decline or Transformation? The Future of the University in a Knowledge Economy and a Post-Modern Age." In *The University and the Knowledge Society*, edited by Peter Baggen, Agnes Tellings, and Wouter van Haaften, 13-30. Bemmel, NL: Concorde Publishing House, 1998.

Shearer, R. A. "Public Policy and the British Columbia Economy." In *Exploiting Our Economic Potential: Public Policy and the British Columbia Economy*, edited by R. Shearer, 141-151. Toronto: Holt, Rinehart, and Winston of Canada, 1968.

Shearmur, Richard. "Book Review of *Innovation, Institutions, and Territory: Regional Innovations Systems in Canada.*" *Canadian Journal of Regional Science* 24, no. 1 (Spring 2001): 141-145.

Shearmur, Richard. *Economic Development in Canadian Peripheral Regions, 1971 to 1996: A Statistical Overview*. Montreal and Moncton: Institut National de la Recherche Scientifique and the Canadian Institute for Research on Regional Development, September 2001.

Sierra Club of Canada. *Tenure Reform and Community Forests: A Sierra Club Fact Sheet.* No date. http://www.sierraclub.ca/national/programs/biodiversity/forests/community-forests/.

Simpson, Geoffrey. "We Have Seen the Future, and It's Sprawl and Emissions." Comment. *The Globe and Mail*, March 16, 2007.

Sitwell, O. F. G. and N. R. M. Seifried. *The Regional Structure of the Canadian Economy.* Toronto: Methuen Publications, 1984.

Snickars, Folke. "On Cores and Peripheries in the Network Economy." In *European Resource based Periphery in a Knowledge Economy*, edited by Gosta Oscarsson. Helsinki: Nordic Institute on Regional Research, 1989.

Social Sciences and Humanities Research Council of Canada. "Standard Research Grants." 14 June 2007. http://www.sshrc.ca/web/winning/comp_results/2007/srg_2007.pdf

Southcott, Chris. "Introduction." In *Provincial Hinterland: Social Inequality in Northwestern Ontario*, edited by Chris Southcott, 1-4. Halifax: Fernwood Publishing, 1993.

Stanbury, W. T. and Ilan B. Vertinsky. "Governing Instruments for Forest Policy in British Columbia: A Positive and Normative Analysis." In *The Wealth of Forests: Markets, Regulation, and Sustainable Forestry*, edited by Chris Tollefson, 42-77. Vancouver: UBC Press, 1998.

Statistics Canada. "1996 Community Profiles." http://www12.statcan.ca/english/Profil/PlaceSearchForm1.cfm

Statistics Canada. "2001 Aboriginal Population Profile."

http://www12.statcan.ca/english/Profil01ab/PlaceSearchForm1.cfm

Statistics Canada. "2001 Community Profiles." http://www12.statcan.ca/english/Profil01/CP01/Index.cfm?Lang=E

Statistics Canada. "2006 Community Profiles." http://www12.statcan.ca/english/census06/data/profiles/community/Index.cfm?Lang=E

Statistics Canada. "Study: Postsecondary Attendance Among Local Youth Following the Opening of a New University." *The Daily*. Ottawa: Statistics Canada, 25 January 2007.

Statistics Canada. "National Graduates Survey: Manitoba Graduates. Class of 2000." *The Daily*. Ottawa: Statistics Canada, 18 May 2005. http://www.statcan.ca/Daily/English/050518/d050518e.htm.

Statistics Canada. "Study: Variation in Occupational Skill Levels Between Rural and Urban Canada." *The Daily*. Ottawa: Statistics Canada, 24 February 2005.

Stauffer, Brian Dale. "Resource Development Patterns of the British Columbia Salmon Canning Industry, 1870 to 1970." MA thesis, University of Northern British Columbia, 2001.

Stauffer, Brian and Greg Halseth. "Population Change in Prince George." In *Prince George: A Social Geography of B.C.'s Northern Capital*, edited by Greg and Regine Halseth, 13-44. Prince George: UNBC Press, 1998.

Stedman, Richard C., John R. Parkins, and Thomas M. Beckley. "Forest Dependence and Community Well-being in Rural Canada: Variation by Forest Sector and Region." *Canadian Journal of Forest Research* 35 (2005): 215-220.

Thanki, Roisin. "How Do We Know the Value of Higher Education to Regional Development?" *Regional Studies* 33, no. 1 (1999): 84-89.

Tindal, C. Richard, and Susan Nobes Tindal. *Local Government in Canada*, 5th edition. Scarborough, ON: Nelson Thomson Learning, 2000.

Tomblin, Stephen G. "W.A.C. Bennett and Province-Building in British Columbia." *BC Studies* 85 (Spring 1990): 45-61.

Travers, O. R. "Forest Policy: Rhetoric and Reality." In *Touch Wood: BC Forests at the Crossroads*. Edited by Ken Drushka, Bob Nixon, and Ray Travers, 171-224. Madeira Park, BC: Harbour Publishing, 1993.

Tykkyläinen, Markku. "The Knowledge Economy in a core-periphery system." In

European Resource based Periphery in a Knowledge Economy, edited by Gosta Oscarsson. Helsinki: Nordic Institute on Regional Research, 1989.

Tykkyläinen, Markku and Cecily Neil. "Socio-Economic Restructuring in Resource Communities: Evolving a Comparative Approach." *Community Development Journal* 30, no. 1 (January 1995): 31-47.

Union of British Columbia Municipalities. "2003 Annual Report." http://ubcm.ihostez.com/contentengine/launch.asp?ID=892&Action=bypass.

University College of the North. "Annual Academic Report 2005-2006." https://www.ucn.ca/about/UCN%20Annual%20Academic%20Report%202005%202006.pdf.

University College of the North. "Annual Report 2005-06." https://www.ucn.ca/about/05_06_annual_report_6.pdf

University of Northern British Columbia. *1994-1995 Calendar*. Prince George: University of Northern British Columbia, 1993.

University of Northern British Columbia. *About UNBC: Guide and Statistics 2007*. Prince George, University of Northern British Columbia, 2007.

University of Northern British Columbia. "Planning for Growth: The Report of the University Planning Committee." 3 January 1997. http://www.unbc.ca/reports/upc_report_1997/index.html.

University of Northern British Columbia. "UNBC History, 1987-1994." http://www.unbc.ca/unbchistory.

University of Northern British Columbia. *Update: A Newsletter for UNBC Alumni and Friends*. Prince George, University of Northern British Columbia, Spring 2006. http://www.unbc.ca/assets/update/spring2006/update_spring_2006.pdf.

Varga, Attila. "Regional Economic Effects of University Research: A Survey." Unpublished paper, West Virginia University, October 1997. http://www.rri.wvu.edu//wpapers/pdffiles/surveyattila.pdf.

Vavakova, Blanka. "The New Social Contract Between Governments, Universities and Society: Has the Old One Failed?" *Minerva* 36 (1998): 209-228.

Veiga, Marcello M., Malcolm Scoble, Mary Louise McAllister. "Mining with Communities." *Natural Resources Forum* 25 (2001): 191-2002.

Veld, Roel in't, Hans-Peter Fussel, and Guy Neave. *Relations Between the State and Higher Education.* Martinus Nijhoff Publishers, 1996.

Verleun, Leo J., and Brian W. Mackenzie. *Mining Potential in Northern and Southern Canada: Guidelines for Regional Development Policy.* Kingston: Centre for Resource Studies, Queen's University, 1988.

Walter, G. R. "Staples, Regional Growth, and Community Sustainability." In *Troubles in the Rainforest: British Columbia's Forest Economy in Transition*, edited by R. Hayter and T.J. Barnes, 287-303. Victoria: Western Geographical Press, 1997.

Ward, Neil, Jane Atterton, Tae-Yeon Kim, Philip Lowe, Jeremy Phillipson, and Nicola Thompson. "Universities, the Knowledge Economy and 'Neo-Endogenous Regional Development.'" Centre for Rural Economy Discussion Paper Series No. 1, University of Newcastle Upon Tyne, November 2005. http://www.ncl.ac.uk/cre/publish/discussionpapers/pdfs/discussionpaper1.pdf.

Water Encyclopedia. Entry for "Rights, Riparian." http://www.waterencyclopedia.com

Way, Laura A. "Bringing the Region to the World and the World to the Region: The Impact of Place on the Role of Universities in Non-Metropolitan Regions." Paper presentation, 2007 Canadian Political Science Association conference, Saskatoon, SK, 1 June 2007.

Way, Laura. "Recruitment and Retention Challenges of a Regional Centre of a Resource-based Region: The Case Study of Prince George, B.C." MA thesis, University of Northern British Columbia, 2005.

Weaver, Clyde and Thomas I. Gunton. "From Drought Resistance to Megaprojects: Fifty Years of Regional Theory and Policy in Canada." In *The Canadian Economy: A Regional Perspective*, edited by Donald J. Savoie, 190-224. Toronto: Methuen Publications, 1986.

Wedley, John R. "Infrastructure and Resources: Governments and Their Promotion of Northern Development in British Columbia 1945-1975." PhD diss., University of Western Ontario, 1986.

Weller, Geoffrey R. "Hinterland Politics: The Case of Northwestern Ontario." In *Provincial Hinterland: Social Inequality in Northwestern Ontario*, edited by Chris Southcott, 5-28. Halifax: Fernwood Publishing, 1993.

Weller, Geoffrey R. "The Impact of a New University in a Developing Region: The Case of the University of Northern British Columbia." *Higher Education Policy* 11 (1998): 281-290.

Weller, Geoffrey. "Universities in the Circumpolar North: A Comparative Analysis." In *Canada's Sub-Arctic Universities*, edited by Peter Adams and Doug Parker, 3-16. Ottawa: ACUNS, 1987.

Weller, Geoffrey R. "Universities in Northern Canada." In *Higher Education Across the*

Circumpolar North, edited by Douglas C. Nord and Geoffrey R. Weller, 100-121. Houndmills, UK: Palgrave MacMillan, 2002.

Weller, Geoffrey R., and David Soleau. "Integrating an Academic Plan and a Campus Master Plan: The Case of UNBC." *Canadian Journal of Higher Education* 26, no. 1 (1996): 109-132,

Wilkinson, Bruce W. "Globalization of Canada's Resource Sector: An Innisian Perspective." In *Troubles in the Rainforest: British Columbia's Forest Economy in Transition*, edited by R. Hayter and T.J. Barnes, 131-147. Victoria: Western Geographical Press, 1997.

Williamson, Tom and Rene Samson. "Forest Communities in Transition: An empirical Assessment of the Changing Structure of the Rural Forest Economy," in *A Stake in the North: Papers on Mining, Forestry, and Remote Tourism Employment*, edited by Ray D. Bollman, 9-20. Brandon: Canadian Rural Restructuring Foundation, 1997.

Williston, Eileen and Betty Keller. *Forests, Power, and Policy: The Legacy of Ray Williston.* Prince George: Caitlin Press, 1997.

World Trade Organization. "Annex B-1: Responses of Canada to Questions Posed in the Context of the Second Substantive Meeting of the Panel." June 24, 2002. http://www.international.gc.ca/assets/trade-agreements-accords-commerciaux/pdfs/236r_c_e.pdf

Yakabuski, Konrad. "It Ain't Pretty." *Globe and Mail*, November 29, 2007.