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Innovation and Creativity on the Periphery: Challenges and Opportunities in Northern Ontario

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Innovation and Creativity on the Periphery: Challenges and Opportunities in Northern Ontario

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INTRODUCTION¹

There is a common perception in Ontario that: “everything that matters is located along the 401, except for Ottawa.” Although this perception understandably recognizes the important role of large metropolitan areas in the economic and cultural life of the Province, it tends to undermine the value of the vast periphery of smaller cities and towns that exist outside of this core region. More profoundly, this commonly held perception is an actual disservice to the people and enterprises that live, work and play in peripheral parts of the Province. Drawing on evidence from Northern Ontario – Ontario’s traditional resource periphery – we challenge the prevailing perception. We argue that despite Northern Ontario’s challenges and contrary to perceptions, the region does offer unique opportunities for more innovative and creative forms of economic development. Particular strengths for Northern Ontario include expertise in high-tech mining; eco-friendly forestry; remote health care; and the cultural production of the North. There is also the emergence of a small number of other knowledge-intensive companies spinning out of research at public institutions in Thunder Bay and Sault St. Marie.² In addition to providing case studies on

¹ This paper represents the views of the authors and we take full responsibility for any errors.

² There are a number of other innovative companies and organizations offering unique opportunities for economic development on the periphery that were outside the scope of this research. For example, the Algonquin Flight Centre in North Bay is a unique flight training centre. In the Thunder Bay area, there are companies like Cinevate, a manufacturer of precision cinema accessories and Global Hydration, a producer of clean water systems for disaster and emergency usage. Sault Ste. Marie is also emerging in energy with the development of a solar generation project and the largest wind farm in Canada. Atikoken is soon to be home to a new Bio-energy Research Centre. Plus Science North, an interactive science centre in Sudbury,

creative and innovative enterprises, we also explore the challenges and opportunities of economic development in the periphery. We then move to a discussion on the importance of geographically sensitive policy approaches, and we conclude with an examination on the implications of this research for current debates in the economic geography literature on creativity, innovation, and community resilience. These ideas are pertinent given the current economic slowdown facing most regions in Ontario and around the world.

THE BIASED GEOGRAPHY OF THE CONTEMPORARY-KNOWLEDGE ECONOMY

Much of the research on the contemporary-knowledge economy starts from the assumption that economic inputs have shifted away from traditional resources and physical attributes towards new knowledge and innovations. Ideas-generation, then, is what drives the new knowledge economy (Cooke and Leydesdorff 2006; Cooke et al. 2007; David and Foray 2003; Martin 2007; Boekema et al. 2000; Courchene 2001; Sands and Reese 2008; Florida 2002). In economic geography, numerous concepts are used to describe this shift, including ‘creative’ economy, ‘information’ economy, ‘service’ economy, ‘knowledge’ economy or the ‘New Economy’ (Martin 2007; Polèse et al. 2002). In the creative economy, according to Florida (2002), economic inputs are now dependent on the talent of a ‘creative class’, “whose economic function is to generate new ideas, new technologies and/or creative output” (Florida, 2002:8). The creative class is attracted to places that offer diversity; a wide range of natural, cultural and recreational amenities; as well as tolerance. The importance of place to economic prosperity is thus seen to be paramount in the creativity economy (Florida 2002; 2005; Donald and Morrow 2003).

Given the renewed interest in quality of place as a key attribute to the knowledge-economy, it is not surprising that most of the research on the creative and knowledge economy has tended to focus on core, large metropolitan areas as the obvious spaces where creativity thrives (Florida 2005; Mcgranahan and

has created Science North Enterprises and offers consulting, exhibit design and production, film production, and other services. Interestingly, Science North was developed as an economic development initiative in 1984.

Wojan 2007; Sands and Reese 2008; Stam et al. 2008). In fact, creative economy variables like talent, tolerance, and technology are biased by design to favour large, core metropolitan areas. In Canada, it's not surprising that creative and high-tech industries are concentrating in and around large metropolitan areas like Toronto, Montreal, Ottawa and Vancouver (Polèse et al. 2002; Gertler et al. 2002; Beckstead et al. 2003) and that these large core areas are attracting higher proportions of 'talented' individuals who are highly educated (Polèse et al. 2002; Gertler et al. 2002). Florida admits that "...size really is an advantage. If you're big, you can offer a lot of options and do a lot of things" and "not surprisingly, many large cities made the top of the indexes..." (Dreher 2002). Meanwhile, smaller, peripheral places end up at the bottom of league tables (Gertler et al. 2002) producing a perception that these places are not talented or creative.

The creative economy literature is not alone in this spatial discrimination. Much of the contemporary economic geography literature is focussed on core, large metropolitan areas. In the regional innovation systems and clusters literature, for example, much of the academic attention is paid to advanced regions like Silicon Valley, Boston, Baden-Württemberg, Toronto and Montreal (Morgan and Nauwelaers 2003; Virkkala 2007; Lagendijk and Lorentzen 2007; Holbrook and Wolfe 2000). As Virkkala (2007) comments "[p]eripheral and more distant areas have largely been ignored, as they have seldom been the target of innovation studies" (511). In addition, Hayter (2005) states that "[r]esource peripheries are not usually cited in relation to new economic spaces..." (199) while Johnstone and Haddow (2003) add that peripheries, like Cape Breton, are seen as 'inauspicious' spaces for the dynamic and innovative preconditions in the 'new economy'. Polèse et al. (2002) further argue that the overwhelming amount of innovations that are produced in large metropolitan areas "...sometimes leads to the assumption that almost all innovation occurs in large cities...but this can blind us to the innovations occurring outside these regions" (133). Moreover, examples of innovation and creativity in the periphery are often overlooked because they occur within traditional sectors like mining or forestry rather than

sectors at the forefront of technological developments (Polèse et al. 2002; Rutherford and Holmes 2007; Lagendijk and Lorentzen 2007).

Ultimately, this spatial bias creates a dualistic depiction that sees, on the one hand, core, large metropolitan areas as creative and cosmopolitan economic drivers and on the other hand, many smaller, peripheral places as economic failures. The remainder of this paper reports on a preliminary investigation into creativity and innovation in Northern Ontario. Drawing on insights from an innovation systems perspective, we conducted interviews with fifteen key informants, including entrepreneurs and organizations involved in Northern economic development³. The semi-structured, thematic interviews were conducted over a period of two months between September 2008 and October 2008. In the subsequent section, we provide contextual background on the demographic and economic trends in Northern Ontario. This is followed by a description of creative and innovative enterprises and then a discussion of key trends emerging from the interview process.

INNOVATION AND CREATIVITY ON THE ONTARIO PERIPHERY

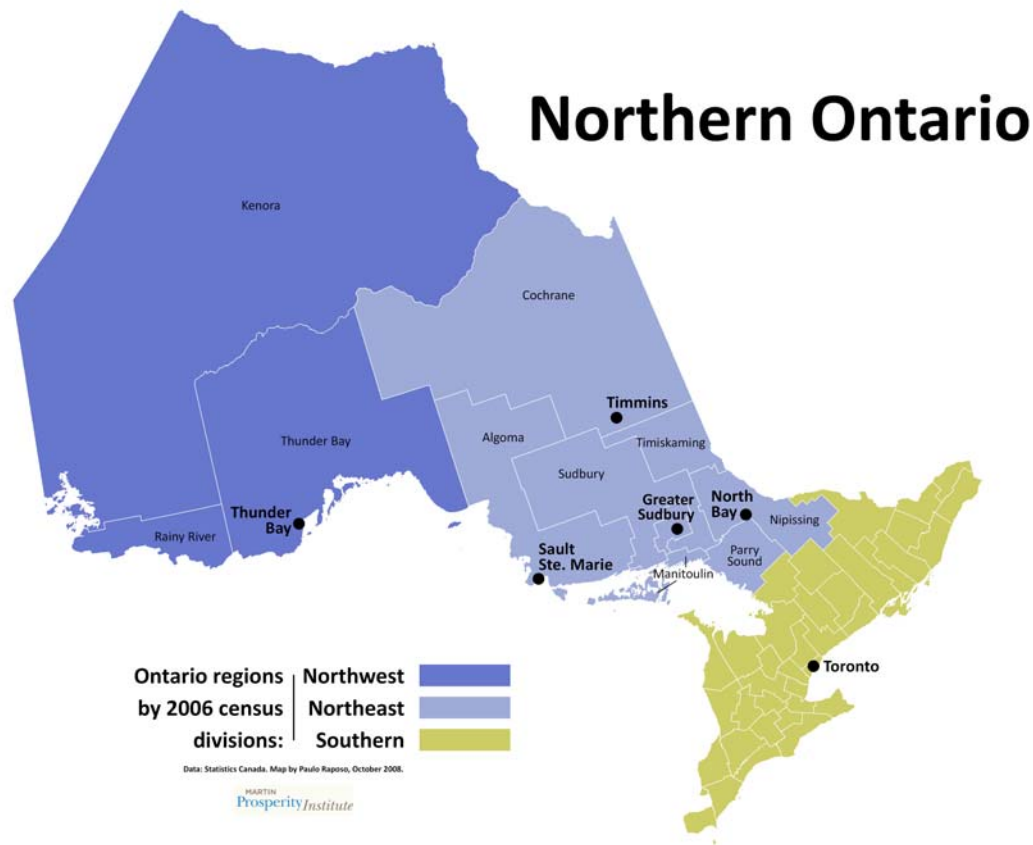
Northern Ontario is a symbolic region that lacks any political autonomy. It encompasses over 90 percent of the provincial landmass, stretching from Parry Sound, north to the shores of Hudson Bay, west to the border of Manitoba and east to the border of Quebec. This region has had a long history of resource dependency with forestry and mining dominating the economy in most communities. Traditionally the region was developed as a hinterland for the province and the region has retained its peripheral status due to the absence of a large metropolitan area (population >500,000), low population densities, and resource dependency. Northern Ontario has over 78% of Ontario's woodlands, some of the richest mineral deposits in the world and contributes 5.2% to Ontario's GDP (Ontario 2008). The region consists of two distinct sub-regions: North-eastern and North-western Ontario (refer to Northern Ontario map).

³ This research has received ethics approval from the Queen's University General Research Ethics Board (GREB). This research is part of a larger provincial report on *Ontario in the Creative Age* being led by Roger Martin and Richard Florida at the University of Toronto, Martin Prosperity Institute.

North-eastern Ontario has a larger population (551,244 compared with 235,046) and is closely tied to mining while North-western Ontario is closely tied to forestry and experiences more distance-to-market related challenges (Rosehart 2008). These two industries are highly susceptible to boom bust economies with forestry currently suffering a downturn while mining is booming.

The population remained virtually the same between 2001 and 2006 (approximately 786,290), however, the region is declining as a percentage of the population of the province (Southcott 2007). Though Northern Ontario's population base is relatively small when compared to Ontario's, its population is greater than Canada's three smallest provinces: Prince Edward Island, Newfoundland and Labrador, and New Brunswick. Over 55 percent of the population resides in the five largest urban centres: Greater Sudbury (157,857), Thunder Bay (109,140), Sault Ste. Marie (74,948), North Bay (53,966), and Timmins (42,997) (Census of Canada 2006). These urban centres, especially Greater Sudbury and Thunder Bay, function as regional service centres for retail, education, healthcare, and government services. The remainder of the population is distributed among much smaller resource and Aboriginal⁴ communities. Given these economic and demographic characteristics, Northern Ontario might appear as an inauspicious space for creativity and innovation. However, creative enterprises do have the potential to thrive in this periphery and the following section details innovative and creative enterprises in traditional and emerging sectors in Northern Ontario.

⁴ Studying the potential of the Aboriginal creative economy was outside the scope of this study although examples are emerging in Northern Ontario.



Innovation & Creativity in Natural Resources: Mining and Forestry

‘Creative’ enterprises on the periphery do exist but they challenge our traditional ideas of creativity and innovation because they often involve generating new ideas, products and processes or enhancing and altering existing innovations in traditional sectors like mining and forestry. Polèse et al. (2002) provide a detailed study of innovative activities in Quebec and Atlantic Canada where entrepreneurs are creating innovative products, processes, and solutions in new mining techniques, technology and consulting, new cutting techniques for wood products, and environmental engineering and aquaculture techniques (134).

State of the Art High-Tech Mining

In Northern Ontario, a variety of companies and organizations are introducing new technologies or methods to improve the efficiency, safety, and sustainability in the mining industry. During the 1980s, the major mining companies in Northern Ontario began downsizing and outsourcing services and production.

This release of skilled labour and management combined with a large number of unemployed miners' with tacit knowledge of the industry resulted in the development of a mining supply and services cluster⁵ (Robinson 2005). These small and medium sized enterprises (SMEs) are creating and adapting technologies, products, and services for local, regional, national, and international mining markets. Significant progress has been made in linking and promoting the mining cluster in Northern Ontario through the Sudbury-and-area Mining Supply & Service Association (SAMSSA), the Northern Centre for Advanced Technology Inc. (NORCAT), the Centre for Excellence in Mining Innovation (CEMI), and the Ontario Mining Industry Cluster Council (OMICC).

Several of these companies and organizations are engaged in innovative solutions for the mining industry and also in creating or adapting products using new technologies. For example, the Northern Centre for Advanced Technology Inc. (NORCAT), a Sudbury-based, not-for-profit incorporated company, was established in 1995. At that time, Darryl Lake (Cambrian College Dean of health, science, trades and technology) and Glen Crombie (Cambrian College President) saw a technology centre as a way to stem youth out-migration and assist the mining supply SMEs. The pair traveled to Finland to learn from the experiences of government-funded product development and innovation centres. Although the same level of government involvement was not available in Canada, NORCAT was able to obtain performance loans from the Ontario Sector Partnership Fund, FedNor, and the Northern Ontario Heritage Fund to establish the Centre (Tollinsky 2005). NORCAT is now self-sustaining and it is also a leader in occupational health and safety training, mine training, technology innovation and commercialization.

NORCAT has created custom-designed e-learning and training software for contractor orientation and common core training in mining along with Occupational Health and Safety training. Over 200,000 contractors and 4,000 companies use the NORCAT Card as an Occupational Health and Safety Credit while companies in the oil sands and hospitals across Canada are using the

⁵ The mining supply and services cluster is located mainly in Sudbury, North Bay & Timmins

NORCAT e-learning software. NORCAT is also active in developing mining technologies and incubating small and medium-sized enterprises in their Underground Centre. This Centre is a unique mine that enables product testing and prototyping along with training. Primarily because of this mine and the expertise that it generates, the Canadian Space Agency and NASA have partnered with NORCAT to develop space mining equipment including a subsurface drilling unit which is being tested for applications on the moon. NORCAT is now venturing into technologies for health care and green technologies for the mining industry.

The Mining Innovation, Rehabilitation and Applied Research Corporation (MIRARCO) is another not-for-profit engaged in mining innovation. This centre evolved out of the Geomechanics Research Group at Laurentian University and was established in 1998 with a mission to develop the people and tools to design and manage the underground mines of the future. The three major areas of research include geomechanics, mining technology, and environmental monitoring. Their global niche is in virtual reality creating 3-dimensional systems for data visualization, mine planning and exploration, and event simulation. The organization has sold systems for mining applications in Utah, China, and Sudbury. MIRARCO has also licensed a financial-based software that optimizes the extraction of rock from underground thus improving efficiency and reducing costs.

Jannatec Radio Technologies, located in Sudbury, is an example of a small company (16 employees) designing innovative products for the mining industry. The Johnny Light Radio Cap Lamp applies communications technology with a two-way radio in a 'mine-tough' casing that works with a miner's cap lamp. Another product is their Jannatec Advanced Warning System (J.A.W.S.) which incorporates radio frequency transceivers that can be fixed on vehicles and humans. The transceivers detect one another and warn the wearer and vehicle operator about possible contact. The technology can also be applied to other hazards. Another product is Safety Trak, a computerized system that monitors miners underground through their two-way radio. If a miner fails to check-in at a scheduled time, Safety Trak will automatically page the miner until they do. If

the miner still fails to check-in, a supervisor is paged and a microphone can be initiated to listen for sounds in the work area of the missing miner. These products have helped mines in the Sudbury-area with communications and safety and their market is expanding into British Columbia, Newfoundland, and the United States. Jannatec is just one example of over 270 mining SMEs in Sudbury creating innovations for the mining industry in Northern Ontario (Robinson 2005).

Eco-Friendly Bio-Forestry

Like mining, the forestry sector in Northern Ontario has a number of innovative companies creating or adapting products and processes for pest management, reforestation, and carbon sequestering. Mikro-Tek, a small Timmins-based biotechnology company that started in 1989, uses specific naturally occurring micro-organisms known as mycorrhizae fungi to colonize the root-tissue of plants forming a symbiotic relationship. This relationship increases nutrient and moisture uptake resulting in plant growth and survival. The company started off as a tree nursery and discovered this technique when searching for ways to improve plant growth on mine tailings. Mikro-Tek uses a process that isolates the specific strain of mycorrhizae fungi for a specific plant which are then cultured, mass-produced and inoculated into the seedling's root in the nursery before planting. Untreated seedlings on the tailings had a 90 percent mortality compared with 80-90 percent survival with treated seedlings. The company has worked across Canada as well as in Chile, Martinique, Costa Rica and California. Mikro-Tek has four employees in Timmins and one in Chile. In fact, in Chile Mikro-Tek is designing projects for carbon sequestration, in the reforestation and afforestation sectors under the Kyoto Clean Development Mechanism. By 2012, their pilot forestry sites in Chile are expected to sequester around 500,000 tonnes of carbon dioxide.

Bioforestry Technology Inc. started in 1996 after federal downsizing with the Canadian Forest Service in Sault Ste. Marie. Former Forest Service workers decided to fill the gap. The company consists of six employees in Sault Ste. Marie, one in Saskatchewan, and one in Quebec. They offer services in field surveys and

consulting to detect, monitor, and assess major forest pests. One of the company's spin-off products has been the EcoJect® System, one of the most efficient and safest tree injectors due to its limited exposure to the user, bystanders, and the environment. Bioforest, in partnership with the Canadian Forest Service, also created TreeAzin™ Systemic, a bio-insecticide derived from the neem tree, for emerald ash borer treatment. The company also develops decision support software systems to assist forest managers with pest management to minimize pesticide use and help identify target areas. Clients include provincial governments, private industries, cottage associations, and private woodlot owners across Canada and more recently the United States.

Natural Resource Jurisdictional Advantage

The examples above clearly demonstrate that Northern Ontario offers a unique jurisdictional advantage in natural resources. More importantly, unlike human resources, natural resources are relatively immobile. As one key informant explained,

...the mines are where they are because that's where the ore is. You can't take the mine to Seattle or in this instance to Brazil or to Switzerland. It just doesn't work because these are where the mines are. So the employment remains here, the service industry remains here and hence the innovation will remain here if you can capture it and work with it because this is where mining actually happens (KI-01).

Key informants also discussed the importance of having their companies and organizations located in geographical proximity to the mines or the forests to research, test and/or sell their products. According to one key informant,

...we often have to demonstrate the research that, if you like, the products that we're developing and you can of course do that so much easier if you have the mines here. If you can drive in the morning, you can go down and run these demonstrations and you can go home in the evening (KI-01).

For these companies, a Southern Ontario location would be a disadvantage, not only from a logistics perspective, but also because there is no history or expertise in mining and forestry in Southern Ontario. Northern Ontario has a natural competitive advantage in mining and forestry, as one key informant expressed,

I've been to South Africa, I've been to Europe now, I've been to the United States. I have never been to a mining community that has as much to offer as the Sudbury basin. It has more mines, it has the best infrastructure, [and] it has a city. You go to most mines in the world you go...out into no man's land, okay? Here, we've got it all (KI-04).

'Creative' enterprises in more traditional sectors on the periphery challenge our traditional ideas of creativity and innovation because sectors like mining and forestry are considered 'old' and are thought to have mostly moved off-shore or are simply at the end of their cycle in their Canadian region of origin. But as Fitzgibbons et al. (2004), have argued many of these 'older' industries are in fact fundamentally linked to the new economy because, like their high-technology counterparts, they must embrace knowledge-intensive innovations to remain competitive. The false dichotomy between these 'old' and 'new' sectors that is often presented within the literature only serves to reinforce the notion that older, or more mature industrial sectors no longer contribute to the growth and productivity of regional economies.

PIONEERS IN THE 'CREATIVE' ECONOMY

Contrary to perceptions, 'Creative' enterprises are also emerging on the periphery in remote health, the cultural production of the North, and other knowledge-intensive industries. These industries are often concentrated in large core regions. However, on the periphery they can emerge and provide new opportunities for economic diversity and development.

Remote Health Care & Health Research

Tom Courchene, one of Canada's leading economic policy thinkers, argues that "health is emerging as one of the leading-edge economic sectors for employment,

innovation, research and exports” (2003: 11) in the knowledge-based economy. Recognizing the importance of the health sector for Northern Ontario’s health and economy, a consortium of doctors, politicians and activists from Sudbury began to lobby in the early 2000s for a Northern Medical School. In 2005, the Northern Ontario School of Medicine (NOSM) opened with campuses in Sudbury and Thunder Bay. NOSM is the first medical school in 30 years to open its doors and is only the second in North America during that same time period. The medical school has a social accountability mandate to focus on issues relevant to the North. For example, Aboriginal and rural health are two key areas for clinical research while basic research is focusing on drug discovery from natural products obtained in the boreal forest through their bio-prospecting initiative. Interestingly, NOSM is using the forestry expertise (foresters, biologists, botanists, GIS technicians etc.) in Sault Ste Marie for this bio-prospecting project. NOSM is connected to over 100 communities in the North with an aim to improve access and confront the health issues facing small and remote areas. The medical school is also drawing on regional knowledge in natural resources to advance their unique medical research mandate.

Genesis Genomics Inc., a Thunder Bay-based company, was started in 2001 and spun out of research conducted by Robert Thayer and Ryan Parr at Lakehead University (Thunder Bay) and Mark Birch-Machin at the University of Newcastle (UK). The company has 13 employees located in Thunder Bay and three in Newcastle. Last year, Genesis Genomics was selected as one of Canada’s top investment prospects for 2008 --- a Canadian Top Ten Company in Life Sciences. The company focuses on early cancer detection using mitochondrial DNA and has filed patents for the early detection of cancers including breast cancer, prostate cancer, skin cancer and melanoma, lung cancer, and colorectal cancer, among others. The company has developed products such as **skinphysical**® (measures the damage to a person’s DNA from sun exposure), **genescreen**™ (identifies variants in a gene responsible for pigmentation to determine risk for developing skin cancer), **DNA●care**™ (assesses the ability of sun and skincare products to protect against UV radiation), and **BIOPSY+**™ (diagnostic test to confirm prostate cancer results).

In Thunder Bay, a variety of health-related research laboratories and programs are emerging. Lakehead University offers programs in Biotechnology, Applied Biomolecular Science, and Paleo-DNA. Also located in the City are a Molecular Medicine Research Centre (Rosehart 2008) and a Centre for Regenerative Medicine. Interestingly, the Paleo-DNA lab at Lakehead is one of the leading ancient DNA labs in the world. The lab was involved with the identification of the unknown child from the Titanic and it is currently participating in research on 'The Lost Tomb of Jesus' (Anderson 2008).

Cultural production in the North

In Northern Ontario, the natural landscape is often a source of creative inspiration. Mitchell et al. (2004) found that rural communities offer advantages for visual artists in terms of creativity. They discovered "...for many, particularly in Parry Sound, that the landscape provides the raw materials (i.e. subject matter) for the creative process" (162). Likewise Canadian landscape painters the Group of Seven used Northern Ontario as a source of inspiration in their work. More recently, Edward Burtynsky used shockingly, breathtaking photos of mine tailings and other industrial locations in Elliot Lake and Sudbury in his award-winning work, *Manufactured Landscapes*. The rugged beauty, heritage, and unique industrial settings on the periphery can provide a jurisdictional advantage for cultural production.

In addition, creative economy companies in film and digital animation are also emerging in Northern Ontario. Music and Film in Motion (MFM), a non-for-profit company located in Sudbury, was established in 1999 to cultivate and promote the music and film industries in Northern Ontario. This organization grew out of two sources: the success of Cinefest Sudbury International Film Festival, one of Canada's five premiere film festivals, and a local entrepreneur, Mark Palumbo. The desire on the film side was to provide consultation services for industry development and to market Northern Ontario as a location for film, television, and music while the music side needed an organization that could help artists and provide assistance. MFM has hosted over thirty productions and the estimated economic benefit of film and TV production in the North since 2001

has been \$60 million. In 2001, Paul Gross (Canadian actor and director) selected Sudbury as a location for his big budget production *Men with Brooms* while the television movie, *Shania, A Life in Eight Albums*, based on the life of country signer Shania Twain, was filmed in Sudbury during 2004. Last year, *Météo+*, the first Franco-Ontarian sitcom, began shooting in Sudbury largely due to the efforts of MFM in lobbying for government grants for the industry.⁶

Another company connected to the creative economy is March Entertainment, founded by Sudbury native Dan Hawes, which produces digital-animation entertainment for television, film internet, and wireless platforms. In 2003, the company opened a 13,000 square-foot production facility in downtown Sudbury employing animators, programmers and designers. The Sudbury location is due in large part to the assistance of local politicians in obtaining a loan from the provincial government. They are best known for their CBC cartoon *Chilly Beach* about a fictitious small, unsuccessful, Canadian resort town where all the stereotypes of Canadian life, like living in igloos and getting eaten by polar bears, are true. Since 2003, the company has created seven more brands. The company has approximately 100 employees in Sudbury. There are offices in Toronto and other major cities to gain access to talent and to retain a foothold into the Canadian entertainment industry, but Sudbury is currently their largest office.

Northern Geomatics

During the 1990s, Algoma Steel in Sault Ste. Marie downsized prompting community leaders to examine ways to diversify the economy. In 1999, the Sault Ste. Marie Innovation Centre (SSMIC), a not-for-profit organization, opened to act as a catalyst for growth in the information technology and knowledge-based sectors. One of their market development projects is a community geomatics center that provides geographic information systems (GIS) services across Ontario. This centre has won awards for their work from ESRI, ESRI Canada, and URISA (Urban & Regional Information Systems Association). SSMIC is also

⁶ A number of Northern Film companies are emerging including Nortario Films and a number of Aboriginal companies including Pine Needle Blankets Productions.

working on co-developing a software product with a private sector company called Infonaut to help manage the spread of infectious disease using GIS and real-time location systems within a hospital facility. A fascinating component of their organization is a portal site where IT workers who have left Sault Ste. Marie can register and receive updates about job opportunities.

These are the stories that get ignored or overlooked in the research on the contemporary knowledge-based economy. 'Creative' enterprises can succeed on the periphery and have place-based jurisdictional advantages in such areas as forestry, mining, remote health care and Northern culture. Several key informants in Northern Ontario emphasized the excitement of being a creative pioneer on the periphery like KI-06 who stated, "So for me when I saw the opportunity of being involved and starting up a brand new innovative culture, I found that really, really exciting...". In terms of advantages, one key informant stated that being peripheral is a benefit because,

...people sort of forget you exist and you can do a lot of great things and then pick your places where you want to announce, pick your places where you want to collaborate and move forward on your agenda and not somebody else's (KI-07).

Plus, in areas like film the periphery offers untapped, unique locations and arguably less bureaucracy for closing streets and using public areas in scenes.

CHALLENGES FOR 'CREATIVE' ENTERPRISES IN NORTHERN ONTARIO

The above paragraphs review some bright lights in Northern Ontario, however, the region also faces unique challenges and barriers (see Rosehart 2008 for forestry and Northwestern Ontario; Mulholland and Vincent 2007 for small and medium-sized businesses; NOLUM 2003 and 2005 for urban areas). Unstable economic conditions, especially for communities tied to natural resources, and limited employment opportunities often leads to youth out-migration, higher proportions of seniors, and a relatively homogeneous population. The region is also facing challenges related to revenue generation and lower post-secondary educational attainment. Other issues impacting growth include distances or the

peripheral reality, biases, perceptions and uneven power relationships, and talent attraction and retention.

The Peripheral Reality

Geographic isolation is a reality in the periphery and it constantly challenges ‘creative’ enterprises (Polèse et al. 2002; Virkkala 2007; Lagendijk and Lorentzen 2007; Petrov 2008). As one key informant explained,

Obviously Sudbury and the North, it’s far. The distances are extreme. We have you know, what an eighth of the population of the province in a landmass the size of France?...That’s a challenge (KI-10).

This issue is exacerbated by high transportation costs, limited transportation options, and infrastructure constraints. Key informants expressed concerns over high gas prices that tend to be more expensive in Northern Ontario and the lack of efficient and affordable alternatives. For example, train transportation between Sudbury and Toronto is sporadic with services running once daily three times a week and Sault Ste. Marie and Thunder Bay have no train service. Train service with a Northern carrier is available six days a week but it is limited to the Toronto, North Bay, and Cochrane corridor. Air transportation is too expensive as one key informant stated,

We can’t afford to fly in...you know unless you have long leave time you’re looking at anywhere from you know \$600 to \$1000...so it’s really restrictive (KI-09).

These distances and the lack of affordable transportation alternatives seriously undermine the creative advantage of peripheral regions. Possible solutions include improving highway connections, creating additional routes for *Ontario Northland* (a provincial motor coach and rail enterprise), and establishing a rebate or travel grant program for Northern entrepreneurs.

Another major issue confronting creative pioneers on the periphery is what we call, “natural resources complacency”. Essentially, this means that when a natural resource sector is doing well, the economic development regime tends

to sit on its laurels and ignore diversifying the economy away from the boom-bust cycles that are inherent in the resource sector. As one key informant mentioned, "...there's...less of a sense of urgency where you know some of the local people think hey everything's okay...so there's less of a hurt or pain" (KI-09). In addition, many of the programs aimed at funding economic development in Northern Ontario move too slow for the fast-paced nature of emerging 'creative' sectors as one frustrated key informant explained,

So finding a way to cut through the bureaucracy, having a clear understanding of what were actually looking for. Be able to move on that quickly. So create a template for investments and when something ticks the boxes, move on! It's that simple! (KI-09)

The key in peripheral regions, especially those tied to natural resource, is to remain actively involved in economic development regardless of boom or bust. Wolfe and Gertler (2002)'s concept of institutional rigidity could be applied for thinking about the governance complacency that often accompanies a 'boom' cycle. Institutional rigidity is where "institutions impede the process of social and economic adaptation" (12), especially when some enterprises in a region seek to take a path in economic development that is un-chartered and contrary to the existing trajectory. Thus it is imperative that regional institutions adapt and learn (Wolfe and Gertler 2002; Florida 1995; Morgan 1997).

Biases, Perceptions & Power

The spatial bias and the perception that peripheral areas are economic failures in the contemporary-knowledge based economy are major issues that challenge investment and policies. In Northern Ontario, there is a "[d]eep sense of grievance and alienation...which is partly a reflection of a perceived ignorance of the north on the part of those in Queen's Park or the south in general" (Weller 1997: 284). Most of the key informants emphasized this perceived ignorance as one key informant discussed,

I think Queen's Park is a bit out of touch with the North. I don't think they spend much time thinking about the North and that's

just my own perception that may be absolutely false but you know they're not represented well in the North and so I think we suffer from that. I think we're often perceived for example in the Sault it's just a steel town...you know and Sudbury's just a nickel town and Thunder Bay is just a port city ...(KI-05).

Many of the key informants also felt that government policies are sometimes insensitive to issues facing the North. Key informants expressed concerns that the emphasis on creative industries and innovation is Southern Ontario centric or that "It's...often felt that you know...all the true innovation comes from...the Greater Toronto Area (KI-11). For example, although the Province funds Northern innovation through their Ontario Centres of Excellences (OCes), all of the Centres are located in Southern Ontario, namely Toronto, Ottawa, Mississauga and Waterloo. We believe that establishing Centres of Excellence in all regions would encourage regional innovation and promote geographic sensitivity.

Private investors appear to have a similar size-based and spatial bias about investing in the periphery. A number of key informants discussed difficulties in obtaining investment from Southern Ontario. As one key informant explained,

Our founders were discussing equity financing with an institution in Toronto and that institution was interested in the corporate story until they realized the company was based in Thunder Bay. The comment from the institution's representative was 'I thought you said North Bay'implying that they don't finance anything further north than North Bay (KI-07).

As a result of the financial difficulties, several angel investor groups have emerged, such as the Northern Ontario Enterprise Gateway which evolved out of a FedNor funded study and links Northern investors with entrepreneurs. These biases and perceptions impact creativity and innovation on the periphery by devaluing entrepreneurial activities. This becomes a self-perpetuating model where innovations become 'locked in' the region. One key informant described this when discussing mining innovations:

[This region] suffers from a little bit of what the Australians call the 'cringe mentality'. There is a feeling because it [has] been

innovated and developed here in Northern Ontario, the rest of the world surely must have something as good or better. And the reality is often they don't. But you've got to then make the rest of the world aware of it and that is the challenge (KI-01).

Real or perceived, this policy and investor spatial discrimination undermines the creative and innovative potential of the periphery and is a disservice to the people who are innovating there.

Related to this, are the issues of power as many regions are peripheral from the key institutions of government control. As Massey (2005) states, "space is not always reducible to distance" (91). In Ontario, the provincial legislature is located in downtown Toronto leaving many other regions to feel out of sight and out of mind. As one key informant explained, "So you've got a government that's at best neutral but where there are established interests leaning on it who live next door and another population which in theory gets treated equally but in practice has no control..." (KI-13). Lagendijk and Lorentzen (2007) reinforce this idea in their editorial on innovation in peripheral regions:

[t]he difference between 'core' and 'periphery' is basically a difference of power" and that the "Key mechanisms of power and control, e.g. of granting access to places and resources, remain heavily founded upon territory-based practices" (462).

Furthermore, in Ontario the provincial government is the steward of mining and forestry resource revenue which reinforces the core – periphery dichotomy. We believe that one possible solution is to create geographically sensitive policies or policies with geographic distinctions and to ensure geographical representation in government institutions.

Exporting Talent

Key informants also expressed concern about attracting and retaining talent. This issue is one that faces many peripheral regions and is a symptom of limited educational and economic opportunities (Polèse et al. 2002). In natural resources, the mining downturn in the 1980s and 1990s contributed to the current human resource shortage in skilled miners and professionals. As one key

informant said, mining was seen as “dirty, dangerous, and dying” (KI-01). This has also led to a serious issue with succession planning in many mining-related SMEs with foreign buy-outs and closures looming as possibilities. The talent shortage is also an issue in emerging sectors like health, digital animation and other knowledge-intensive industries. One emerging company had to open an office in Ottawa because of the talent shortage in the region while other key informants discussed the high turnover of hiring people from outside the region who remain long enough to be trained. Key informants argued that Northern Ontario is rich in natural and human resources, however, as one noted, “For about 20 years we’ve been exporting a lot of people” (KI-08). Increasing post-secondary educational opportunities on the periphery is one solution to this problem; however, a simultaneous emphasis on creating corresponding job opportunities is needed to slow this export.

WHAT CAN WE LEARN FROM THE PERIPHERY?

Despite these challenges, there are some lessons that can be learned from Northern Ontario for other peripheral regions and core metropolitan areas. Quality of place attributes offer an alternative to ‘big-city’ living and attributes like affordability and the natural environment play a central role in this appeal. However, job opportunities ultimately provide the ability to locate on the periphery. In addition, a number of regional innovation systems are in place that provide strategic investment and establish civic support for economic development initiatives. More importantly, many communities and entrepreneurs have a strong sense of perseverance and resilience given the challenges they face.

The Importance of Place and Job Opportunities on the Periphery

A central theme in the creative economy literature is the importance of place. Urban amenities like arts and culture, vibrant downtowns, coffee shops, cafés, and excitement are seen as vital for attracting creativity (Florida 2002; Dreher

2002). A clear trend in Northern Ontario is 'Back at 30'⁷. Many key informants discussed how they returned to Northern Ontario in the 30s to raise their children or to take a break from big city living. As one key informant explained,

I also think that in Thunder Bay there is a huge network of people that were born and raised in Thunder Bay....maybe went to University in a number of different places and they are at the stage where now they've got these great degrees from leading institutions like Queen's, like Western...or even further abroad than that, they've worked for global companies, they've got all this great experience but they've got a young family and they're tired of the rat race in Toronto, they're tired of the rat race in New York or wherever they might be and they want to come home (KI-07).

They continued on to say, "You know, in my previous life I worked for IBM and I'm one of those people who wanted to come back to Thunder Bay" (KI-07). Another key informant noted that from an economic standpoint that age is when you want them: "They're productive, they're buying homes, they're making money and they're ready to go. So, hopefully we can continue that trend" (KI-08). Likewise in their study, Mcgranahan and Wojan (2007) discovered that the rural creative class were older and more likely to be married.

What attracted many of the key informants is the rich silver-lining that exists in many Northern communities (Hall 2008). For many, the periphery offers a rich quality of life and an alternative to the 'rat race' in large cities. As one key informant stated, "it probably would be more efficient if we were in Southern Ontario in...a place like Toronto where you can hop on a plane more quickly but...there's some significant advantages to being in the Sault in terms of lifestyle and everything else" (KI-05). The natural environment and affordability were cited as obvious advantages. Lakes and forests dot the landscape – Greater Sudbury alone has more than 330 lakes within its municipal boundaries. Plus, environmental issues like smog are far less prevalent in this region when compared to Southern Ontario. Traffic congestion is relatively non-existent and housing prices are significantly more affordable. As one key informant noted,

⁷ Back at 30 was a campaign developed by a local Mayor in Sudbury to target people who had left Sudbury as youth for employment and educational opportunities.

“...the lifestyle is a little bit [more] laid back then down in Toronto. Easier to get to work, it takes me five minutes to get to work so it’s a lot less of a hassle that way anyway” (KI-02) while another had a friend in a large city who calculated the average time he spent commuting: “he spent three whole weeks a year commuting and I thought yeah you add that up over a career and [you] think well what did I do in my life?” (KI-01).

Another key informant explained how artists and musicians are financially constrained and that the expenses of living in a big city cause many to struggle:

if you think about a musician who’s got you know a shorter dollar to spread around amongst all their expenses there is potential for our communities here in the North not only to function as retirement communities but artistic communities where artists could live more comfortably, where their dollar can stretch further...(KI-10).

Likewise, Mitchell et al. (2004) found that rural communities offer advantages for visual artists in terms of affordability when compared to artist life in the bigger cities. The key then is to invest in quality of place ensuring affordability and protecting natural amenities. One key informant described how the housing boom and apartment shortage in Sudbury, resulting from the mining resurgence, was hurting their company:

At one point you know the thinking was hey you could come home and the cost of...you know the cost of housing would be cheaper. Unfortunately in the last five years it’s been the exact opposite...Even if we get people up in Sudbury we can’t get accommodations. It’s just...I don’t know what to do. We have people they come up to Sudbury and we’ve literally billeted them because there are no apartments available (KI-09).

Rather than spending limited resources on being the ‘coolest’ places to live peripheral regions should focus on maintaining and improving the qualities that make them great places to live including investing in the quality of local education, maintaining affordability, and protecting natural amenities. In the end, this type of policy-thinking would benefit all regions.

Related to this, is the debate in the creative economy literature over the causality of urban and regional growth (see Florida 2002; 2005; Markusen 2006; Storper and Manville 2006; Sands and Reese 2008; Pratt 2008). On one side of the debate is the argument that natural and cultural amenities, tolerance, and diversity attract skilled workers which in turn fuels growth (Jacobs 1969; Florida 2002; 2005). However, as Storper and Manville (2006) argue “Jacobs, Florida and Glaeser are all onto something in claiming that skills and amenities go together, but they may have got their causality reversed...” (1254). They continue on to say that “[p]eople generally locate where they can maximise their access to jobs” and “[a]ny other explanation simply puts the cart before the horse” (1254). Although Northern Ontario has a rich quality of place that attracted many key informants back to the region, job prospects provided them with the opportunity to return. Thus, economic development strategies in the periphery need to have a strong focus on creating jobs opportunities while recognizing the importance of place qualities like affordability and natural amenities.

Strategic Investment & Regional Partnerships

Northern Ontario has a number of regional, sub-regional, and local economic development organizations that work to promote economic diversity and growth. At the region level, Northern Ontario has the direct support of two economic government groups: FedNor, a federal economic development agency, and a provincial ministry known as the Ministry of Northern Development and Mines (MNDM)⁸. Key informants emphasized the importance of these two agencies which provide the North with financial resources and guidance. These agencies have people on the ground in Northern Ontario who can work directly with companies and organizations. In some instances this has resulted in programs specifically catered to the needs of industry resulting in economic benefits. Although some might argue that strategic investment provides an unfair advantage, key informants view it as levelling the playing field: “We don’t have

⁸ Several other government organizations were cited as instrumental including: the Ministry of Culture, Ministry of Natural Resources, Ministry of Research and Innovation, the Ontario Centres of Excellence, and the Industrial Research Assistance Program.

that track record, we're a start-up organization so I think where the Province has really fulfilled a really critical niche for us is they've given us some money to give us that opportunity" (KI-06).

Northern Ontario has also benefited from the strategic investment of key government functions. The provincial *Northern Ontario Relocation Program* was developed in the mid-1980s to relocate 1,600 jobs to Sudbury, North Bay, Sault Ste Marie, and Thunder Bay (Savoie 1992). Furthermore, in 1992 the provincial government also moved the Ontario Geological Survey and the offices of Northern Development and Mines from Toronto to Sudbury (Robinson 2005). One key informant described this event as, "The most successful regional development strategy in Northern Ontario in the last 50 years" (KI-13) because of its spin-offs. The mining supply and services cluster, the mining research networks like CEMI and MIRARCO, and the strengthening of the Laurentian University geology and engineering programs are testaments to this move. Although the initial costs associated with moving these offices to the region and running them may be more expensive, the regional development benefits far outweigh those costs.

Also important in the periphery are the partnerships and networks of institutions like universities, colleges, innovation centres, industrial organizations and government agencies. Often these networks are referred to as 'regional innovation systems' which are essentially the economic, political, and institutional relationships in a given area (Wolfe 1999). Not-for-profits like the Northwestern Ontario Innovation Centre, the Sault Ste. Marie Innovation Centre (SSMIC), and NORCAT are providing guidance, resources, and expertise for SMEs. The SSMIC has contributed over \$14.5 million to the local economy and created around 430 jobs while NORCAT has helped to create 41 new companies, over 1,000 jobs, 300 completed projects (80 percent of which have been commercialized or deployed in some way) and has brought over \$100 million into the community. These are a just a few of the several economic development agencies promoting regional and sub-regional development.

In peripheral regions post-secondary institutions were often created to stem youth out-migration and generate economic development (Weller 1994). In

Northern Ontario, post-secondary institutions and research institutions are important to the regional innovation system. As mentioned, Genesis Genomics spun out of research conducted at Lakehead University while the SSMIC is building on the success of GIS and gaming programs at the local college and university. In addition, forestry related companies are using the expertise of the Canadian Forest Service Lab, Great Lakes Forest Research Centre, the Ontario Forest Research Institute as well as the Ontario Ministry of Natural Resources Forest Entomology Group in Sault Ste. Marie. We believe that strengthening education and research on the periphery does have a positive impact on innovation and creativity.

Civic Capital & Resilience

For many years, the economic geography literature has explored the value of social capital in promoting and enhancing knowledge networks and innovation (Morgan 1997; Cooke and Wills 1999; Landry et al. 2002; Bathelt et al. 2004). More recently, however, Wolfe (2008) and others have been exploring the idea of civic capital to the social dynamics of economic performance of a region. According to Wolfe (2008), civic capital is defined as the “...interpersonal networks and solidarity within a community based on a shared identity, expectations or goals and tied to a specific region or locality.” This can also be referred as “bounded solidarity” which is a term used in sociology to explain the solidarity that exists because of a common fate (Portes 1998). A number of key informants told stories of civic capital and the value it held for their organizations. As one key informant, discussing the Northern Ontario Medical School, mentioned,

The communities in the North have been tremendously supportive...It's just overwhelming the support we get and it doesn't matter whether you're talking to a Mayor or just an every[day] citizen. Like...when we have a seminar here it will be in the paper! The support we get in the North is just staggering for somebody who comes from Southern Ontario (KI-06).

Another key informant talked about the community and industry working to clean up a town selected for scenes in the movie, *Men with Brooms*:

...their goal was to clean the streets in Copper Cliff like the gutters and everything, clean everything out so that when the producers got here everything would be spit shine clean... without anyone having asked...the community rose up and did that to welcome these producers (KI-10).

A number of key informants also discussed how local and regional leaders would approach them and ask, “What can we do for you?” Obviously, peripheral regions don’t have the same natural buzz that exists in a big city, but they can facilitate economic development and prosperity through civic support.

Related to this, many peripheral regions have a strong sense of community pride, resilience and perseverance because they have had to deal with economic hardships in the past which have united citizens in their on-going search for new economic initiatives. This can in return result in unique partnerships for innovative economic development. For example, since 1978 over 9 million trees have been planted in Greater Sudbury through its land reclamation program. Faced with an economic downturn in mining and a world-wide reputation as a city with a blackened industrial landscape, a collection of concerned citizens, the city, university, and industry actors, united to re-green the area. Their efforts resulted in an industrial land reclamation technique (Winterhalder 1983; 1996) and several distinctions including a United Nations commendation. As one key informant discussed,

....really the greening by demonstrating that it could be changed from that black landscape into a green landscape created a lot of hope and I think indirectly, although we don’t have any measures or proof to the fact, I think it has been successful in attracting economic...has helped...the economic development of the area (KI-12)

The success at obtaining government support for the Northern Ontario Medical School is also a testament to this community perseverance and civic capital where industry, government, and communities lobbied for its establishment. Through

local hockey tournaments, industry and private donations, and local NOSM groups⁹ the region continues to support the medical school.

This resiliency and civic capital is also engrained into entrepreneurs on the periphery. Previous research has documented that “[a] more hostile business environment may...encourage firms to become more, rather than less innovative in order to overcome the constraints they are facing” (Virkkala 2007: 514). Furthermore, Polèse et al. (2002) argue that “[they] are tempted to suggest that entrepreneurial success in peripheral regions requires more originality and ingenuity (to succeed despite the many barriers) than in central areas” (146). In Northern Ontario, one key informant stated:

I would say there’s a Northern Ontario attitude and it’s I’m going do it for myself because no one’s going to do it for me and I have to... figure out how I’m going to do it and that... forces people to have to be creative, to find out or to find ways of making things happen (KI-10).

Thus, many peripheral regions have resiliency from the challenges they face like boom-bust economies, their peripheral reality, and the perception that they’re insignificant in the contemporary knowledge-based economy.

CONCLUSIONS & RECOMMENDATIONS

This research has several implications for current debates in the literature on creativity, community resilience, and regional economic development. First, large metropolitan areas like Toronto and Vancouver obviously provide dynamic, favourable spaces for creativity and innovation in the contemporary knowledge-based economy. However, as Hayter et al. (2003) state: “[t]here is a whole world out there and not just a few cores or clusters” (18). Creativity can be found in all industries and places including natural resources and the periphery. The major goal of this paper was to challenge the prevailing perception that peripheries are dull and insignificant spaces. Creative enterprises like digital animation and film

⁹ Local NOSM groups are located in 10 communities throughout Northern Ontario. These groups are volunteer-based and meet to discuss issues related to recruitment, retention, and health as well as showcasing the community to students.

and vital sectors like health do have the potential to thrive on the periphery. Furthermore, the examples of innovation and creativity in the mining and forestry industries challenge contemporary perceptions of the natural resources sector. We agree with Hayter et al. (2003) that research on the contemporary knowledge-based economy would benefit from more geographical variation. In addition, creative variables and league tables are biased by design to favour large, core metropolitan areas. Smaller, peripheral places often end up at the bottom (Gertler et al 2002) contributing to the perception that these places are not talented or creative. As shown in this research, this spatial discrimination can extend into the realms of policy and venture capital. Ultimately peripheral regions are viewed by their challenges rather than their creative or innovative potential which can undermine the creative and innovative potential of the periphery. This is a disservice to the people and enterprises in these regions.

The regional economic development literature highlights the importance of regional innovation systems and strategic investment for growth. In peripheries like Northern Ontario, regional innovation systems are important catalysts for development, however, geographically sensitive policy approaches are also needed to combat unique challenges. We argue that policies and approaches developed in large core regions are often not suitable for the periphery. Instead, a strong vision that recognizes the potential of these regions can go a long way in enhancing economic performance.

Another implication of this research is the importance of civic capital and resilience to the social dynamics of economic performance of a region. As seen in Northern Ontario, civic capital enables unique partnerships that create economic development while entrepreneurs and communities have resiliency and perseverance to deal with economic challenges like boom-bust economies and their peripheral realities. These intangible assets are particularly important to all regions given the current economic instability. In the end, geographically sensitive policy approaches focused on inherent challenges and opportunities are more realistic on the periphery. Furthermore, promoting Northern Ontario for its opportunities rather than comparing it to Southern Ontario as a less favoured region can strengthen the province as a whole.

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REFERENCES

- Anderson, T. 2008. Paleo-DNA Lab: A Jewel in Thunder Bay's Crown. *The Chronicle Journal*, August 25th. Retrieved on October 29th, 2008 from: <http://communications.lakeheadu.ca/news/?display=news&nid=492>
- Bathelt, H., Malmberg, A. & Maskell, P. 2004. Clusters and knowledge: local buzz, global pipelines and the process of knowledge creation. *Progress in Human Geography* 28(1): 31- 56.
- Beckstead, D. & Gellatly, G. 2003. The Growth and Development of New Economy industries. *The Canadian Economy in Transition Series*. Statistics Canada (11-622-MIE2003002).
- Boekema, F., Morgan, K., Bakkers, S. & Rutten, R. 2000. Introduction to Learning Regions: A New Issue for Analysis. In F. Boekema et al. (Ed), *Knowledge, Innovation and Economic Growth*. Northampton: Edward Elgar Publishing Inc.
- Census of Canada. 2006. *Profile of age and sex*. Beyond 20/20 Data file from MADGIC.
- Cooke, P. & Wills, D. 1999. Small Firms, Social Capital and the Enhancement of Business Performance Through Innovation Programmes. *Small Business Economics* 13: 219-234.
- Cooke, P. & Leydesdorff, L. 2006. Regional Development in the Knowledge-Based Economy: The Construction of Advantage. *Journal of Technology Transfer*, 31: 5-15.
- Cooke, P., De Laurentis, C., Todtling, F. & Trippl, M. 2007. *Regional Knowledge Economies: Markets, Clusters and Innovation*. Northampton: Edward Elgar Publishing Inc.
- Courchene, T.J. 2001. *A State of Minds: Towards a Human Capital Future for Canadians*. Montreal: The Institute for Research on Public Policy.

Courchene, T.J. 2003. Medicare as a Moral Enterprise: The Romanow and Kirby Perspectives. *Policy Matters* 4(1): 1-20.

David, P.A. & Foray, D. 2003. Economic Fundamentals of the Knowledge Society. *Policy Futures in Education*, 1(1): 20-48.

Donald, B. & Morrow, D. Morrow with A. Athanasiu. 2003. *Competing for Talent: Implications for social and cultural policy in Canadian city-regions*. A report prepared for Strategic Research and Analysis (SRA) Strategic Planning and Policy Coordination, Department of Canadian Heritage.

Dresher, C. 2002. Be Creative -- or Die. *Salon* June 6th. Retrieved on March 24th, 2008 from: <http://www.alternet.org/story/13325/>

Fitzgibbons, S., Holmes, J., Rutherford, T. & Kumar, P. 2004. Shifting Gears: Restructuring and Innovation in the Ontario Automotive Parts Industry. In D.A. Wolfe and M. Lucas (Eds), *Clusters in a Cold Climate: Innovation Dynamics in a Diverse Economy* (pp.11-41). Kingston and Montreal: McGill-Queen's University Press.

Florida, R. 1995. Toward the Learning Region. *Futures* 27(5): 527-536.

Florida, R. 2002. *The Rise of the Creative Class*. New York: Basic Books.

Florida, R. 2005. *Cities and the Creative Class*. New York: Routledge.

Gertler, Meric S., Florida, R., Gates, G. & Vinodrai, T. 2002. *Competing on Creativity: Placing Ontario's Cities in North American Context*. Ontario: Ontario Ministry of Enterprise, Opportunity and Innovation and the Institute for Competitiveness and Prosperity

Hall, H. 2008. Being Realistic About a Growth Plan in Northern Ontario. *Forthcoming*.

Hayter, R. 2005. Regions as Institutions, Inter-regional Firms and New Economic Spaces. In R. Le Heron & J.W. Harrington (Ed), *New Economic Spaces: New Economic Geographies*. Burlington: Ashgate Publishing Company.

Hayter, R., Barnes, T.J. & Bradshaw M.J. 2003. Relocating resource peripheries to the core of economic geography's theorizing: rationale and agenda. *Area* 25(1): 15-23.

Holbrook, J.A. & Wolfe, D.A. (Ed). 2000. *Knowledge, Clusters, and Regional Innovation: Economic Development in Canada*. Montreal & Kingston: McGill-Queen's University Press.

Jacobs, J. 1969. *The Economy of Cities*. New York: Random House.

Legendijk, A. & Lorentzen, A. 2007. Proximity, Knowledge and Innovation in Peripheral Regions. On the Intersection between Geographical and Organizational Proximity. *European Planning Studies* 15(4): 457-466.

Landry, R., Amara, N. & Lamari, M. 2002. Does social capital determine innovation? To what extent? *Technological Forecasting & Social Change* 69: 681-701.

Markusen, A. 2006. Urban development and the politics of a creative class: evidence from a study of artists. *Environment and Planning A* 38: 1921-1940.

Martin, R. 2007. Making Sense of the New Economy? Realities, myths and geographies. In P. Daniels et al. (Eds), *Geographies of the New Economy: Critical reflections*. New York: Routledge.

Massey, D. 2005. *For Space*. London: Sage Publications.

Mcgranahan, D. & Wojan, T. 2007. Recasting the Creative Class to Examine Growth Processes in Rural and Urban Counties. *Regional Studies*, 41(2): 197-216.

Mitchell, C.J.A., Bunting, T.E. & Piccioni, M. 2004. Visual artists: counter-urbanites in the Canadian countryside? *The Canadian Geographer* 48(2): 152-167.

Morgan, K. 1997. The learning region: institutions, innovation and regional renewal. *Regional Studies* 31(5): 491-503.

Morgan, K. & Nauwelaers, C. 2003. A Regional Perspective on Innovation: From Theory to Strategy. In K. Morgan and C. Nauwelaers (Eds), *Regional Innovation Strategies: The Challenge for Less-Favoured Regions* (pp.1- 17). London: Routledge.

Mulholland, R. & Vincent, C. 2007. *The State of Small-and Medium-Sized Enterprises in Northern Ontario*. A report prepared for FedNor and Industry Canada

NOLUM. (2003). *A New Vision for Northern Ontario: Embracing the Future*. Ontario: Northern Ontario Mayors' Coalition, FONOM & NOMA.

NOLUM. (2005). *Creating Our Future: A New Vision for Northern Ontario*. Ontario: Northern Ontario Mayors' Coalition, FONOM & NOMA

Ontario. 2008. Towards a Growth Plan for Northern Ontario: A Discussion Paper. *Places to Grow*. Retrieved on July 26th, 2008 from: <http://www.placestogrow.ca/images/pdfs/North-Discussion-Paper-ENG.pdf>

Petrov, A.N. 2008. A Talent in the Cold? Creative Capital and the Economic Future of the Canadian North. *Forthcoming*.

Polèse, M., Shearmur, R., Desjardins, P.M. & Johnson, M. 2002. *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 and Moncton: Institut national de la recherche scientifique and the Canadian Institute for Research on Regional Development.

Portes, A. 1998. Social capital: its origins and applications in modern sociology. *Annual Review of Sociology* 24(1): 1-24.

Pratt, A. 2008. Creative Cities: The Cultural Industries and the Creative Class. *Geografiska Annaler: Series B, Human Geography* 90(2): 107-117.

Robinson, D.R. 2005. Sudbury's Mining Supply and Service Industry: From a Cluster "In Itself" to a Cluster "For Itself". In David A. Wolfe & Matthew Lucas (Eds), *Global Networks and Local Linkages: The Paradox of Cluster Development in an Open Economy* (pp.155-176). Kingston: McGill-Queen's University Press.

Rosehart, R.G. 2008. Northwestern Ontario: Preparing for Change. *Northwestern Ontario Economic Facilitator Report*. Ontario: Ministry of Northern Development and Mines. Retrieved on September 8th, 2008 from: http://www.mndm.gov.on.ca/nordev/documents/noef/REPORT_FEB2008_e.pdf

Rutherford, T.D. & Holmes, J. 2007. Entrepreneurship, knowledge and learning in cluster formation and evolution: the Windsor Ontario tool, die and mould cluster. *International Journal of Entrepreneurship and Innovation Management*, 7(2-3): 320-344.

Sands, G. & Reese, L.A. 2008. Cultivating the Creative Class: And What About Nanaimo? *Economic Development Quarterly*, 22(1): 8-23.

Savoie, Donald J. 1992. *Regional Economic Development: Canada's search for solutions (2nd Edition)*. Toronto: University of Toronto Press.

Southcott, C. 2007 *The Changing Population of Northern Ontario 2001 to 2006*. 2006 Census Research Paper Series: Report #1. Prepared for the Training Boards of Northern Ontario. Retrieved on September 8th, 2008 from: http://ltab20.on.ca/documents/census2006/Population_Report_2006_Census.pdf

Stam, E., de Jong, J.P.J., & Marlet, G. 2008. Creative Industries in the Netherlands: structure, development, innovativeness and effects on urban growth. *Geografiska Annaler: Series B, Human Geography*, 90(2): 119-132.

Storper, M. & Manville, M. 2006. Behaviour, Preferences and Cities: Urban Theory and Urban Resurgence. *Urban Studies* 43(8): 1247-1274.

Tollinsky, N. 2005. Ten years of technology transfer and innovation. In, *NORCAT 10th Anniversary Souvenir Edition*. Sudbury: Northern Ontario Business.

Virkkala, S. 2007. Innovation and Networking in Peripheral Areas – A Case Study of Emergence and Change in Rural Manufacturing. *European Planning Studies* 15(4): 511-529.

Weller, G.R. 1994. Regionalism, Regionalisation and Regional Development in a University Context: The Case of the University of Northern British Columbia. *Canadian Journal of Regional Science* 17(2): 153-168.

Weller, G.R. 1997. Politics and Policy in the North. In G. White (Ed.), *The Government and Politics of Ontario 5th Edition* (pp.284-306). Toronto: University of Toronto Press.

Winterhalder, K. 1983. The re-greening of Sudbury. *Canadian Geographic* 103(3): 23-29.

Winterhalder, K. 1996. Environmental degradation and rehabilitation of the landscape around Sudbury, a major mining and smelting area. *Environmental Review* 4: 185-224.

Wolfe, D.A. 2008. *Innovation, Creativity and Inclusion*. Presentation at the 10th Annual ISRN Meeting, Montreal, Quebec.

Wolfe, D.A. & Gertler, M.S. 2002. Innovation and Social Learning: an Introduction. In M.S. Gertler and D.A. Wolfe (Eds), *Innovation and Social Learning: Institutional Adaptation in an Era of Technological Change* (pp.1-24). New York: Palgrave Macmillan.

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Working Paper Series

This working paper is part of the *Ontario in the Creative Age* series, a project we are conducting for the Ontario Government. The project was first announced in the 2008 Ontario Budget Speech, and its purpose is to understand the changing composition of Ontario's economy and workforce, examine historical changes and projected future trends affecting Ontario, and provide recommendations to the Province for ensuring that Ontario's economy and people remain globally competitive and prosperous.

The purpose of the working papers in this series is to engage selected issues related to our report: *Ontario in the Creative Age*. The series will involve a number of releases over the course of the coming months. Each paper has been reviewed for content and edited for clarity by Martin Prosperity Institute staff and affiliates. As working papers, they have not undergone rigorous academic peer review.

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