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Arctic Infrastructures: Tele Field Notes

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Abstract

This article contextualizes the conditions of rural “connectivity” in the Canadian Arctic. It examines the emergence of satellites, fibre optic cables, and intranets as modes of social infrastructure at the outset of the twenty-first century. At present, Nunavut, the Northwest Territories, and the Yukon are all at a complicated confluence in that their current and inadequate telecommunications infrastructures are in the process of being renegotiated, re-designed, and re-allotted across civic, governmental, and corporate interests. The article shows how it is at sites of friction that the overlapping if fading legacies of systems-based thinking are emerging: satellites orbiting over fibre optic cable lines; corporate actors competing rather than coordinating with government agencies; and neoliberal rationales of mapping, division, and speed creating disjointed local markets. More broadly, these sites also demonstrate how indigenous forms of “connection” across the globe are increasingly experiencing telecommunications’ lags and temporal disjunctures that are having very material effects on their supposedly post-colonial lives.

Keywords

Telecommunications Infrastructure, Arctic, Nunavut, Time, Media Theory

Operation Nanook

In August of 2009, “Exercise Operation Nanook,”¹ an annual Canadian government-sponsored military training initiative took place in and around Iqaluit, the capital city of the territory of Nunavut. On the 22nd of the month, Prime Minister Stephen Harper, then-Defense Minister Peter McKay, and Commander Alex Grant, assembled on the port bow of the HMCS Toronto, stationed in Frobisher Bay. In a video clip of the occasion,² a clear blue sky hangs above them. In the middle distance stand the impeccably placed Canadian Coast Guard ship the Pierre Radisson and HMCS Cornerbrook, one of Canada’s four submarines. Seemingly on cue, three F-18 fighter jets in formation cruise by the three men. Seeing the event in real time, rather than through the various photographs that have captured the staging in the national press, emphasizes the symbolic, quite nearly propagandistic dimensions (and import) that the current Canadian government is placing on Arctic sovereignty and its demonstration through military presence. The behind-the-scene nature of the clip also gets at the unseen underpinnings of Operation Nanook as a whole. While it was widely considered a “successful” demonstration of Canadian search and rescue capacity, military ability, and the government’s general ease of access and mobility in the Arctic more broadly, the operation also signaled the significant inadequacies of the country’s northern telecommunications infrastructure. During an exercise involving hundreds of soldiers, emergency responders, and other government personnel, their communications activity overwhelmed and immobilized Iqaluit’s telecommunications network.

Key

Over the past number of years, USB keys have been circulating around the Arctic at an increasing rate, both via airmail and on the bodies of corporate and government personnel. The nexus of high-cost bandwidth in northern Canada and the increasing prevalence of data-intensive government and corporate services supported by updatable software programs, are turning Arctic telecommunications

¹ “Operation Nanook,” National Defence and the Canadian Armed Forces, accessed March 12, 2014, <http://www.forces.gc.ca/en/operations-canada-north-america-recurring/opnanook.page#tab-1391073900791-5>.

² “Frobisher Bay Fly Past,” David Akin, youtube.com, accessed March 12, 2014, http://www.youtube.com/watch?v=9m96k_2swUI.

data transfer into a material mode of transportation. Chris Kalluk, an employee of Nunavut Tungavik Incorporated, the territory's cultural and economic organization based in Cambridge Bay, relates how his organization, instead of auto-updating their software, rents server space in Edmonton, a city in northern Alberta, downloads the necessary updates there, and has a local colleague mail a USB key to Cambridge Bay.³ Nunavut's newly developed on-line driver's licensing system faces significant delays in issuing new licenses as, due to bandwidth limitations, driver information cannot be sent over the internet. Rather, USB keys with the necessary driver data are sent via airmail. As Kathleen Lausman, a deputy minister in Nunavut's Department of Community and Government Services, put it: "We have a state-of-the-art vehicle pulled by a team of dogs."⁴

Anomaly/Outage

At 6:36 am on October 6th, Nunavut and parts of the Northwest Territories and the Yukon went dark.⁵ For sixteen hours, telecommunications services were nonexistent for the region's resident population. The outage was due to a malfunction on Telesat Canada's Anik F2 satellite—a "technical anomaly" in the company's estimation. Long distance and local phone services, the internet, cellular connections, and automated banking services were all unavailable. Many banks closed for the day as the sole connection between northern branch locations and southerly headquarters had been rendered inoperative. Retail debit and credit transactions could not be processed. Airlines decided to ground flights departing from Nunavut due to the loss of radar and weather services. Without fibre optic landline connections, Nunavut and the extra-metropolitan regions of the Northwest Territories and the Yukon are all satellite dependent. Nunavut's state

³ Omar El Akkad, "Fast, affordable Internet? The North is still waiting," *The Globe and Mail*, December 10, 2013, accessed March 12, 2014, <http://www.theglobeandmail.com/report-on-business/breakthrough/fast-affordable-internet-the-north-is-still-waiting/article15855643/>.

⁴ "Canada's Arctic a 'telecommunications backwater:' report," *Nunatsiaq Online*, August 30, 2011, accessed March 12, 2014, http://www.nunatsiaqonline.ca/stories/article/65674canadas_arctic_a_telecommunications_backwater_report/.

⁵ "Northern telecom service restored after 16-hour Telesat Canada satellite glitch," *Nunatsiaq Online*, October 6, 2011, accessed March 12, 2014, http://www.nunatsiaqonline.ca/stories/article/65674telesat_canada_screw_up_knocks_out_northern_telcoms/.

of *tele* (at a distance) disconnection, prompted Premier Eva Aariak to ask the Government of Nunavut to go into emergency mode, which entailed having essential services activate their iridium satellite phones in order to establish alternate channels of communication. For the duration of the outage, the Canadian Broadcasting Corporation's radio service was transformed into "Nunavut's communications lifeline" as it was the most readily available means of reaching all of the territory's communities.⁶ The outage was caused by Telesat Canada losing control of the Anik F2 satellite, having it accidentally shift its orientation and turn away from Nunavut. The Anik F2, Anik F1R and Anik F3 are the three satellites upon which northern Canada is dependent.

Collapse

NEWS: Nunavik November 06, 2012 - 6:03 am

Lousy telephone service puts Nunavik at risk, doctor says

"It's as if the telecommunications network in the region was beginning to collapse"

"We call, we wait, nothing happens. It's like we're suspended in outer space. Or sometimes a loud noise blasts our eardrum. At other times, it's the 'South' calling: the line rings. Hello? Hello? No one. But the line rings and rings again later. Without call display, there's no way to know who is trying to call," [Dr. François] Prévost said.⁷

Flux

Canada's northern telecommunications infrastructure is in a state of flux. With new federally-subsidized satellites slated for launch in the next five to ten years, having the express goal of targeting and servicing the country's Arctic regions; the installation of more comprehensive fibre optic cable networks on the near if still tenuous horizon; alternative modes of telecommunications production, distribution, and consumption being created on the ground in the Arctic, largely

⁶ Ibid.

⁷ Jane George, "Lousy telephone service puts Nunavik at risk, doctor says," *Nunatsiaq Online*, November 6, 2012, accessed March 12, 2014, http://www.nunatsiaqonline.ca/stories/article/65674lousy_telephone_service_puts_nunavik_at_risk_doctor_says/.

by indigenous actors; and, finally, the ongoing renegotiation of existing corporate and government telecommunications regulatory regimes a recurring reality, this state of flux signals to what extent Arctic telecommunications infrastructures are a matter of concern for the region's resident population, federal and territorial government personnel, agencies, services, and programs, and regional corporate actors, from multinational mining conglomerates to locally-owned tour operators. This constellation of issues, actors, geographies, and interests, demonstrates to what extent infrastructures can be contested ground across civic, political, and ideological domains. As Susan Leigh Star would have it, this makes of infrastructures both "ecological" and "relational" objects of study in that they point to the distributed constituencies, that are often local and agonistic, that such seemingly mundane and invisible pipes, road networks, and telecommunications systems subtend. "The image becomes more complicated," as Star writes, "when one begins to investigate large-scale technical systems in the making, or to examine the situations of those who are *not* served by a particular infrastructure."⁸ In this sense, I am working out from the importance of "relation" in so much systems-based thinking, and arguing that infrastructures tend towards "open," quasi-ecological systems of emergence and instability rather than cybernetic loops and circuits.⁹ At present, Nunavut, the Northwest Territories, and the Yukon are all at just such a complicated confluence in that their current and inadequate telecommunications infrastructures are in the process of being renegotiated, re-designed, and re-allotted across civic, governmental, and corporate interests. The question of who *will* be served by these restructuring efforts is an open one that I will put under investigation here.

A recent body of largely outstanding scholarly work has addressed what could be thought of as the expanded field of communicative practices and protocols of which infrastructure is increasingly an integral part. These range across analyses of infrastructural systems,¹⁰ satellites,¹¹ and meteorological data.¹²

⁸ Susan Leigh Star, "The Ethnography of Infrastructure," *American Behavioral Scientist*, 43 (3) (November 1999): 380.

⁹ To some extent, this is a return to the biological systems mapped by Ludwig von Bertalanffy in *Modern Theories of Development: An Introduction to Theoretical Biology*, trans. by J.H. Woodger (London: Oxford University Press, 1933).

¹⁰ See Lisa Gitelman, ed., "*Raw Data*" is an Oxymoron (Cambridge, Mass.: MIT Press, 2013); Jeremy Packer and Stephen B. Crofts Wiley, eds., *Communication Matters: Materialist Approaches to Media, Mobility and Networks* (London: Routledge, 2012); Lisa Parks, "Around the Antenna Tree: The Politics of Infrastructural Visibility," *Flow TV* 9(9) (2009), <http://flowtv.org/2010/03/flow-favorites-around-the-antenna-tree-the-politics-of-infrastructural-visibilitylisa-parks-uc-santa-barbara/>; Mimi Sheller, "Infrastructures of the Imagined Island: Software, Mobilities and the Architecture of Caribbean Paradise," *Environment and Planning A* 41 (2009): 1386-1403; Nicole

While this work has been generative in my own thinking on the ways in which infrastructural systems develop, coalesce, and establish regimes of signification and material access, they have often not directly addressed the ways in which infrastructures, to return to Star, are sited ecological-relational practices, and this might predominantly pertain to telecommunications infrastructures in the Arctic region. While much of Star's work, and that undertaken with Karen Ruhleder in particular,¹³ has focused on the relationships between types of labour, technological frameworks, and infrastructural systems, it nonetheless marks the important ways in which infrastructures are embedded in given social practices and technologies; become transparent via recurrent deployment and extend their reach beyond a phenomenon of single use; create forms of learned membership; establish links with preexisting modes of practice in a given system; embody regulated standards; telescope both backwards and forwards to interact with past and future systems; become visible in moments of breakdown; and signal the ways in which their forms of organization overshoot a single agency of control, thus incorporating incremental and diffuse forms of change.¹⁴

My primary goal here is to situate these contested characteristics of telecommunications infrastructures as they pertain to the Arctic as an emergent site of regional, national, and transnational connection. I aim to describe the sites

Starosielski, "'Warning: Do Not Dig': Negotiating the Visibility of Critical Infrastructures," *Journal of Visual Culture* 11(1) (2012): 38-57, "Critical Nodes, Cultural Networks: Re-mapping Guam's Cable Infrastructure," *Amerasia* 37(3) (2012): 18-27, and "Beaches, Fields, and other Network Environments," *Octopus Journal* 5 (2011): 1-7; Nicole Starosielski, Braxton Soderman, and Cris Cheek, eds. "Network Archaeology [Special Issue]," *Amodern* 2 (2013), <http://amodern.net/issues/amodern-2-network-archaeology/>.

¹¹ See Lisa Parks, *Cultures in Orbit: Satellites and the Televisual* (Durham: Duke University Press, 2005), "Earth Observation and Signal Territories: Studying U.S. Broadcast Infrastructure through Historical Network Maps, Google Earth, and Fieldwork," *Canadian Journal of Communication* 38(3) (2013): 285-307; Lisa Parks and James Schwoch, eds., *Down to Earth: Satellite Technologies, Industries, and Cultures* (New Brunswick, N.J.: Rutgers University Press, 2012); Chris Russill, ed., "Earth-Observing Media [Special Issue]," *Canadian Journal of Communication* 38(3) (2013).

¹² See Chris Russill and Zoe Nyssa, "The Tipping Point Trend in Climate Change Communication," *Global Environmental Change* 19(3) (2009): 336-344; Chris Russill, "Forecast Earth: Hole, Index, Alert," *Canadian Journal of Communication* 38(3) (2013): 421-442.

¹³ See Susan Leigh Star and Karen Ruhleder, "Steps Toward an Ecology of Infrastructure: Design and Access for Large Information Spaces," *Information Systems Research* 7(1) (1996): 111-134.

¹⁴ Star, "The Ethnography of Infrastructure," 381-382.

of “friction” into which these states of communicative emergence are cohering, whether they pertain to extractive industries such as iron ore mining or the changeable constitution of on-the-land indigenous ontologies. As Anna Tsing writes:

Speaking of friction is a reminder of the importance of interaction in defining movement, cultural form, and agency. Friction is not just about slowing things down. Friction is required to keep global power in motion. It shows us (as one advertising jingle put it) where the rubber meets the road. Roads are a good image for conceptualizing how friction works: Roads create pathways that make motion easier and more efficient, but in doing so they limit where we go. The ease of travel they facilitate is also a structure of confinement. Friction inflects historical trajectories, enabling, excluding, and particularizing.¹⁵

In a first section, “Indigene,” I examine the Digital Indigenous Democracy project, based in Nunavut, and its role in the approval of the Baffinland iron ore mine. In the next section, “Satellite Futures,” I consider the role such corporations as Telesat Canada are playing in the establishment of “local” conditions of broadband connectivity in the Arctic. Finally, in “Incidental Connection,” I describe the currently proposed creation of an extensive fibre optic network across eleven communities in Nunavut by Arctic Fibre Incorporated, with this last section opening onto a concluding note on how we can go about studying both these infrastructural materialities and conditions of the present with a view to establishing more coherent anthropological approaches to these sites of connection.

While each section offers an Operation Nanook-style scenography of the actors and issues at play in each seemingly distinct geographic region and timeframe, they nonetheless seek to cohere into emblematic sites of “friction” that demonstrate how infrastructural systems constitute emergent relationships across a number of agonistic constituencies that are marking the expanded field of the Canadian communications landscape. It is at these sites of friction that the overlapping if fading legacies of systems-based thinking emerge: satellites orbiting over fibre optic cable lines; corporate actors competing rather than coordinating with government agencies; and neoliberal rationales of mapping, division, and speed creating disjointed local markets. More broadly, these sites demonstrate how indigenous forms of “connection” across the globe are

¹⁵ Anna Lowenhaupt Tsing, *Friction: An Ethnography of Global Connection* (Princeton: Princeton University Press, 2004), 6.

increasingly experiencing telecommunications' lags and temporal disjunctures that are having very material effects on their supposedly post-colonial lives.

Indigene

The Digital Indigenous Democracy (DID) network was launched in 2012 by Isuma TV.¹⁶ The network was created by Norman Cohn and Zacharias Kunuk, the latter best known as the director of *Atanarjuat* (2001). DID is a networked media platform designed to foster Inuit-forms of consensus building in the Arctic, though largely operating at present only in Nunavut. The project was launched in response to an Environmental Review (ER) of the proposed Baffinland Iron Mines Corporation mine site at Mary's River on North Baffin Island, which, if approved, would become one of the largest open-pit iron ore mines in the world.¹⁷ In order to facilitate the timely and transparent undertaking of the ER and the necessary sharing of information that this entails amongst the communities affected by the mine, Isuma launched the DID as part of its Angiqatiginigniq Internet Network (AIN), a media platform operating across community radio, local television, DIY filmmaking, and two-way high-speed internet. With typically low and costly speeds of broadband access in the majority of these communities, DID installs mediaplayers in each of the seven communities impacted by the ER that then stream Inuktitut-language Isuma TV programs, facilitate the uploading of user-generated content, and, across its other media platforms, informs the collective process of community consultation. The ultimate goal of the consensus process is a "multimedia Human Rights Impact Assessment" that will determine, in part, the costs and benefits of the Baffinland mine to and for the residents around Mary's River.¹⁸ While, presumably, the AIN will continue to operate beyond the completion of the ER process, the work of the network raises some important questions around the relationships between

¹⁶ Digital Indigenous Democracy, "About", accessed March 12, 2014, www.isuma.tv/en/DID/About.

¹⁷ With the pace of northern resource development increasing, the twin poles of negotiation and convenience primarily characterize the relationship between diverse indigenous groups and the Canadian government. The former touches on the territorial independence achieved and the concomitant mineral rights held by indigenous groups, while the latter addresses the narrow, resource-driven policy frameworks through which many governmental actors view a large part of northern Canada. Moreover, it is large-scale mining projects that offer one of the only prospects of secure and medium term wage-labour to members of local communities.

¹⁸ *Ibid.*

resource extraction and community-appropriate norms of consultation; the instrumentalization of new media technologies and the existential stakes of certain cultural formations; as well as the need for “transparent” modes of communication and local forms of governance. In many ways, the DID and the AIN mark the typically grey ethical shapes that certain forms of de-colonizing knowledge production can take: preserving and disseminating knowledges of longevity and situation while mediating new relationships with one’s land-as-territory, as well as the adaptable ontologies and futural markets that it contains.

The DID network is an example of an infrastructural project that, at once, facilitates the development of such extractive industries as iron ore mining, while also creating a sense of pan-community-scale cohesion by enabling Inuktitut-language programming and information-sharing to bind geographically distinct communities together. On March 18, 2014, the Nunavut Impact Review Board (NIRB) approved the Baffinland Iron Ore Mines Corporation’s Early Revenue Phase Proposal (ERPP).¹⁹ This was the second phase of the consultation process, as the NIRB had already given its approval to the Mary River Project Proposal, which outlined Baffinland’s intention of reclaiming an already existing mine site at Mary River, as well as building a one hundred and fifty kilometre railway to a newly built mine port at Steensby Inlet. The main purpose of the ERPP review was to ascertain the mine’s potential effects on the region’s surrounding ecosystem and socio-economic conditions. Along with a host of other federal and territorial governmental agencies, such as Environment Canada, Transport Canada, and the Pond Inlet Hunters and Trappers Organization, the NIRB also consulted with local residents through Isuma’s DID network, granting Kanuk and Isuma TV intervenor status.²⁰ The NIRB’s report emphasizes that Kanuk and Isuma TV wanted to see international human rights standards be integrated into Baffinland’s corporate responsibility policies.²¹ It credits Kanuk with facilitating a wide spectrum of public participation, and for ensuring that a mine project-specific web portal will “support oral Inuktitut communications.”²²

The DID doubles as both an economic and cultural facilitator, and the disseminator of a dialogue-based method that strives to create a mediated form of Aajiiqatigiingniq (deciding together), Inuit consensus building. It employs what could be thought of as a strategy of infrastructural opportunism in that the

¹⁹ “Public Hearing Report: Mary River Project: Early Revenue Phase Proposal,” Nunavut Impact Review Board, accessed March 22, 2014, http://www.isuma.tv/sites/default/files/attachments/140317-08mn053nirb_12_8_2_public_hearing_report-oede.pdf.

²⁰ *Ibid.*, 11.

²¹ *Ibid.*, 52.

²² *Ibid.*, 52.

network gained a foothold in local communities by taking advantage of the slow and costly bandwidth connections that are prevalent. It largely functions as an extensive intranet that incorporates some modes of two-way communication, with the backbone of the network reliant on Isuma TV Inuktitut-language programming. Yet whom does this process serve? According to the DID, its constituencies include:

lawyers who are solicited to deliver vast amounts of complex information in clear terms; company representatives that are struggling to understand the people, the culture and the challenges relating to land they are seeking to mine; governments and international organizations that are required to monitor and regulate land development and other indigenous peoples that face similar situations on their homelands and who can replicate the DID model in their own community.²³

These layers of facilitation all rely on the DID's infrastructural intervention into the consensus building process, as well as into the pre-existing forms of mediatic organization specific to the Inuit communities surrounding Mary's River. Isuma TV filled an infrastructural gap left by a lack of adequate telecommunications systems in this part of the Arctic, and in filling that gap, incorporated a media-centric network that could both bolster Inuktitut-language use, ties, and presumably generational sharing, and facilitate forms of community-consultation that such extractive industries must rely on to gain territorial and federal regulatory approval. As Paul Edwards contends, infrastructures co-construct "the conditions of modernity."²⁴ In doing so, these infrastructures actively intervene in the production of comprehensive sociotechnical systems that facilitate the circulation of given ideologies, whether of micro-scale cultural development or resource extraction and use.

What the DID signals is how infrastructural relation can render operative a cross section of actors that are all implicated in the unequal standards of a telecommunications system. Rendering them "modern" entails renegotiating the terms by which a shifting sense of indigeneity can conform to emergent land-use practices, with these last often stemming from structural dependencies that make such (extractive) outcomes seem like inevitable ones. Here, "being" indigenous means being beholden to an infrastructural opportunism that implies connective ties to cultural and economic forms of participation that equally contain: the past,

²³ Digital Indigenous Democracy, "About".

²⁴ Paul Edwards, "Infrastructure and Modernity: Force, Time, and Social Organization in the History of Sociotechnical Systems," *Modernity and technology*, Thomas J. Misa, Phillip Brey, and Andrew Feenberg, eds. (Cambridge, Mass.: MIT Press, 2003), 186.

as consensus building, the present, as mediating, language-based participation, and the future, as emergent relationships to the land.

Satellite Futures

Another latent interpretation of that now infamous photo op that Prime Minister Harper anchored, is that of the ways in which it flagged the profound disparities between southern and northern standards of communications infrastructure. Over the past twenty years or so, the infrastructural “digital divide” between these two distinct and unevenly populated regions has been perpetuated by the high cost of media connectivity in such places as the Arctic. While Operation Nanook signaled the need for an improved local telecommunications infrastructure in Iqaluit, its improvement was geared towards its eventual instrumentalization by military and other government departments in the perpetuation of Canadian sovereignty claims in the Arctic.

One outcome of Operation Nanook’s communications failure was the Arctic Communications Infrastructure Assessment Report (ACIA) published in April of 2011. It was funded by the Canadian Northern Economic Development Agency, and sought to address the development and continued improvement of communications infrastructures in the Arctic for the 21st Century. Although the ACIA largely focused on the infrastructural needs of government departments and services, with emergency response and military strategy figuring prominently, it made a number of significant recommendations that framed communications for residents of the Arctic as “a matter of survival.”²⁵ The ACIA report noted how, at present, “[t]here is currently no comprehensive strategy for connecting all Arctic communities to the level of service required within communities or between communities,” equally across the Northwest Territories, the Yukon, and Nunavut.²⁶

With this disparity at the forefront of the report’s findings, its first recommendation called for government and corporate actors to readily commit to service parity across Arctic communities, as well as to ensure minimum connectivity standards for all Arctic communities to equal those offered in southern metropolitan centres, thus ensuring service parity across the entirety of

²⁵ “A Matter of Survival: Arctic Communications Infrastructure in the 21st Century,” Northern Communications & Information Systems Working Group, April 30, 2011, accessed March 12, 2014, http://www.aciareport.ca/resources/acia_full-v1.pdf, 9.

²⁶ *Ibid.*, 10.

Canada's territory, regardless of geographic location.²⁷ Given that the federal government has been the single largest purchaser of bandwidth in the Arctic, the ACIA also recommended that the government outline an Arctic-specific communications strategy to lower the cost of bandwidth and to address the severe shortage of bandwidth in communities served by both terrestrial (microwave and fibre optic) and satellite telecommunications systems. Finally, the report addressed the strengthening of essential communication services in the Arctic, seeking to create redundancies across the developing network in order to eliminate the possibility of blackouts and prolonged gaps in service, especially in emergency response type situations. Overall, the ACIA frames the Arctic as a location-specific market that cannot sustain important levels of corporate competition, and that, for the near future at least, is reliant on satellite-dependent telecommunications systems.

The rural Arctic's (extra-metropolitan Yukon, the Northwest Territories, and the entirety of Nunavut) reliance on what is, in essence, a monopolistic form of service provision by Telesat Canada, a privately owned company, means they are linked to a single type of privatized media connection that is both highly centralized and poorly regulated. This condition of Arctic "rurality" is in part defined by the lack of road infrastructure that connects many of these communities. This absence, that essentially (financially and infrastructurally) precludes the possibility of large-scale fibre optic or microwave forms of service delivery, makes satellite latency an important issue. As the ACIA notes, with delays ranging from eight hundred milliseconds to four seconds, such on-line services as videoconferencing or certain types of webpage retrieval will not work.²⁸ The conjunction between the rural Arctic's satellite dependency and its technical propensity towards latency, makes of rurality a condition of lag across several dimensions of tele-connection; ranging from modes of viewership and on-line/real time participation to broader concerns around community social justice issues. For instance, while Operation Nanook marked a system-wide problem for the Canadian military's communications infrastructure, on a more localized scale, some people in remote communities who suffer or have suffered from forms of domestic violence, fear for their safety because such a basic telecommunications service as call-display is unavailable on their phone lines.²⁹ In the context of Arctic rurality, the forms of learned membership, to return to Star, that its existing infrastructural conditions foster are, by and large, those of a deferred time lag caught in the bandwidth capacities of the early 2000s. Yet these practices and experiences of lag, as the example noted above indicates, taken in conjunction

²⁷ Ibid.

²⁸ Ibid., 86.

²⁹ Ibid., 161.

with the structural conditions of satellite-dependency, that are felt just as much across modes of cultural production and interaction as strategies for economic development, co-construct the real and perceived communicative limits of many communities in the Arctic.

“Despite the centrality of satellite technologies and services in so many aspects of contemporary life,” as Lisa Parks and James Schwoch write, “the histories and practices key to these systems and services remain, by comparison to other means of global electronic information and entertainment, relatively unknown to most observers.”³⁰ For Arctic residents, government personnel, and various scales of commercial actors, satellites are in fact front of mind, and are readily seen as contested technological ground. While different satellites perform different functions, including earth-observation, communications, and scientific (largely physics- and astronomy-related) data collection, without, as the ACIA notes, a comprehensive Arctic communications infrastructure strategy, each function remains in its own regulatory and policy vacuum. A new initiative put forward by the Canadian Space Agency (CSA) is trying to serve the High Arctic region through the Polar Communications and Weather Mission. This would comprise the deployment of two satellites operating in a highly elliptical orbit that targets the High Arctic; unlike the majority of geostationary satellites that orbit the earth along its equatorial plane.³¹ The CSA’s mission goals bring together both communications and meteorological improvements which range across operational capacities for federal departments with Arctic interests, the facilitation of natural resource exploration and exploitation, the enhancement of “connectivity of northern communities to the broadband information backbone infrastructure,” and the provision of “high-quality operational data” to assess meteorological phenomena.³² The conflation of all these interests demonstrates to what extent satellites can act as generative objects of inquiry that, following Parks and Schwoch, “necessitate revisiting communication theories of time/space and the very definition of ‘media’ itself.”³³

Satellite dependency is a condition that brings forward not only the competing, and seemingly at odds, group of actors in what could be thought of as the connection economies of the Arctic, but also manifests the differing forms of ontological presence that are emergent in the Arctic at present. From high-resolution meteorological capture, to data destined for natural gas exploration, to strengthening Arctic sovereignty claims by enabling long-term, futural lines of

³⁰ Parks and Schwoch, “Introduction,” 2.

³¹ “Polar Communication and Weather Mission,” Canadian Space Agency, accessed March 12, 2014, <http://www.asc-csa.gc.ca/eng/satellites/pcw/default.asp>.

³² *Ibid.*

³³ Parks and Schwoch, “Introduction,” 6.

connection between and beyond indigenous lands, all these presences are captured within the complex of functions that satellites offer. With the subsidy that Industry Canada currently provides Nunavut Broadband Corporation's Qiniq telecommunications network set to expire by 2016, Telesat Canada also seems willing to acknowledge that the problem is just as much economic as technical. In a 2012 interview, Jim Bush, then vice-president of Telesat claimed that "[w]e don't have to build anything. The satellites exist today to [address the telecommunications gap between North and South]. There is a perception that there is no capacity available in the North. That's absolutely not true. The challenge is an economic one, not technical."³⁴ While the CSA's PCW project partly contradicts and supersedes Bush's claim, it also conceals the fact that regulatory regimes could enable more equitable forms of telecommunications access. The ACIA report, in searching for best-practice models, flags the government of Australia's establishment of a minimum standard of service of 12 MB/s. The Australian National Broadband Network, with an investment of \$43 billion (AUS) over eight years, aims to build a comprehensive backbone network of both satellite and fibre optic infrastructure that will foster forms of dispersed competition as corporate actors will have access to the public network.³⁵ These sorts of enabling infrastructure strategies also have the effect of shaping the forms of presence that can take shape in such remote regions.

It is telling that the ACIA does indeed deem Arctic communications infrastructure "a matter of survival." "A sovereign Canadian Arctic requires Canadian citizens to live in it," as the report's authors programmatically note. "Resource exploration and extraction is made affordable in part because of the presence of communities with airstrips, hotels, and local workers. The military relies on a network of Rangers to patrol much of the Arctic. These national efforts require national support."³⁶ In this case, infrastructure begets infrastructure. Yet the social ontologies underpinning these infrastructural processes are also evolving in tandem. "Living" in the Arctic clearly means different things to different people. Lines of connection can be drawn and redrawn, equally across national claims, territorial lands, and an ever-expanding orbit of entrenched interests. The satellite bands, microwaves, and fibre optic cables that are being newly built and contested will, at once, both conceal and symbolize to what extent

³⁴ Jim Bell, "Telesat mounts Nunavut PR offensive to prove satellites still have a future," *Nunatsiaq Online*, September 24, 2012, accessed March 12, 2014, http://www.nunatsiaqonline.ca/stories/article/65674telesat_launches_nunavut_pr_offensive_to_prove_satellites_still_have_a/.

³⁵ Northern Communications & Information Systems Working Group, "A Matter of Survival," 174.

³⁶ *Ibid.*, 191-192.

the Arctic is a highly networked environment where people not only survive, but live the experiences of satellite-dependency, tele time lag, and infrastructural opportunism.

Tele-, *comb. form*

1. (Before a vowel properly **tel-**, but more often in the full form), repr. Greek *τηλε-*, combining form of *τῆλε* afar, far off; used in numerous (chiefly recent) scientific and technical terms, mostly denoting or connected with special appliances or methods for operating over long distances; also in several terms connected with psychical research, denoting actions or impressions produced at a distance from the exciting cause, independently of the normal means of communication.³⁷

Incidental Connection

After the devastating 1999 avalanche in Kangiqsualujjuaq, Nunavik, a coroner's report recommended that many Arctic communities should have at least one satellite phone for use in emergencies. In the immediate aftermath of the avalanche, residents faced overloaded long-distance telephone lines (all sixteen of them) when attempting to place calls to emergency responders in other communities. As such, the report also recommended the creation of long-distance telephone lines dedicated to emergency services.³⁸ As is so often the case, it took disaster with a human toll to reveal the tenuous reliability of telecommunications connections between such remote communities and better-provisioned centres to the south. In Inukjuak, in 2012, there were sixteen long-distance lines for a population of two thousand people. Today, many emergency organizations are forced to make appeals via public radio to ask someone to hang up to free a line to address the emergency situation at hand. The question of satellite dependency returns as the majority of northern telephone traffic moves through the limited number of currently orbiting satellites. This minimal level of service, that the ACIA report addressed across internet and telephone connections, makes Arctic

³⁷ *Oxford English Dictionary*, comb. form "Tele-," accessed March 12, 2014, <http://www.oed.com/view/Entry/198666?isAdvanced=false&result=7&rskey=4us4Hm> &.

³⁸ George, "Lousy telephone service puts Nunavik at risk, doctor says."

communities into figurative satellites of a kind in their own right—seemingly caught in their own territorial orbits with costly, unreliable, and low speed forms of connection between them.

On October 30, 2012, Arctic Fibre Inc. announced an amendment to their plan to install an undersea fibre optic cable connecting London, New York, and Tokyo, with a crucial segment of the cable passing through the Canadian Arctic.³⁹ The amendment sought to have a backbone connection of the cable pass through the eastern edge of Hudson Bay from Cape Dorset to Kuujjuaraapik and Chisasibi.⁴⁰ From there, the cable would go through James Bay Cree territory and continue on to Montreal and New York. The advantage of having the backbone of the cable pass through this part of the Canadian Arctic lies in its reducing the distance between Tokyo and New York by several hundred kilometres, thus providing the trading networks that sign on to Arctic Fibre’s cable system with profitable micro-temporalities that could lead to market gains. Along with the backbone connection, Arctic Fibre is proposing a series of spur lines that could benefit communities in Nunavik and Nunavut, as well as the James Bay Cree. Madeleine Redfern, the former mayor of Iqaluit, whose consulting firm undertook regulatory and land claims agreements on behalf of Arctic Fibre upon leaving office, noted that the main backbone proposed by Arctic Fibre would connect fifty-two percent of Nunavut’s population to the more reliable and higher speed fibre optic system. Arctic Fibre is looking for provincial and federal governments to contribute one hundred and sixty-one million dollars to create spur lines for the communities adjacent to the backbone.⁴¹

By July of 2013, Arctic Fibre was organizing a series of community meetings set for late August in the seven locations along the proposed backbone connection in Nunavut.⁴² The company was after local knowledge and input in determining the most appropriate landing sites for the cable spurs, taking into account ice conditions, distance from common anchorages, and wildlife migration

³⁹ “Arctic Fibre Applies For Canadian Landing Licence,” Arctic Fibre Inc., October 3, 2012, accessed March 12, 2014, <http://arcticfibre.com/arctic-fibre-applies-for-canadian-landing-licence/>.

⁴⁰ Jim Bell, “Arctic Fibre to extend high-speed undersea backbone past Nunavik,” *Nunatsiaq Online*, November 5, 2012, accessed March 12, 2014, http://www.nunatsiaqonline.ca/stories/article/65674arctic_fibre_to_extend_high-speed_undersea_backbone_past_nunavik.

⁴¹ *Ibid.*

⁴² “Arctic Fibre ramps up cable project with seven-community Nunavut tour,” *Nunatsiaq Online*, July 26, 2013, accessed March 12, 2014, http://www.nunatsiaqonline.ca/stories/article/65674arctic_fibre_ramps_up_cable_project_with_seven-community_nunavut_tour/.

routes, amongst other factors. During one of these August meetings at the Hotel Arctic in Iqaluit, Doug Cunningham, president and CEO of Arctic Fibre, said “I think there’s a lot that can happen in this community and I think we are creating a great public service that will be a great economic driver.”⁴³ Earlier in the day, Cunningham and a group from Arctic Fibre took Iqaluit community leaders to the proposed landing site of the cable at Apex beach, on the outskirts of the town. The site lies just beyond the access road that leads down to the beach, and would have the cable make landfall at the foot of a few fading Hudson’s Bay Co. buildings. Arctic Fibre officials assured Iqaluit’s community leaders that the cable would be covered with a protective shield over the entirety of its length running along the tidal flats, with the cable itself laid in a submerged trench in order to ensure that it would not be damaged by ice-scouring. The officials claimed that the only visible infrastructure at the site itself would be the covered manhole needed to receive the cable.⁴⁴ In order to gain the necessary cable landing licenses from the federal government, Arctic Fibre first had to go through the approval processes of the Nunavut Impact Review Board (NIRB) and the Nunavut Planning Commission (NPC). On January 23, 2014, the NIRB announced that Arctic Fibre’s project did not require an environmental hearing, but imposed fifty-two terms and conditions primarily touching on the protection of local ecologies.⁴⁵ According to Arctic Fibre, construction of the project will begin in May 2014.⁴⁶

Arctic Fibre, in foregrounding its apparent “Arcticness,” is placing a certain emphasis on this middle ground of the fibre optic infrastructure’s systemic coverage. By taking the undersea cable through the Northwest Passage, Arctic Fibre is laying claim to a very tangible form of infrastructural connection predicated on the reduction of distances and times, and, by extension, the associated political economic benefits that can be derived from such a reduction. According to Arctic Fibre, the six hundred and twenty million dollar project is to be primarily financed by the emergent Asian, largely Chinese, broadband and cellular markets, who are increasingly after G3 and G4 services. “It is international carriers who are paying the freight here,” Cunningham claims. “Our leading tenants will be the Chinese top three telephone companies. Third [sic] will be South Korea, then the Japanese and the Taiwanese.”⁴⁷ In this calculus,

⁴³ Ibid.

⁴⁴ Ibid.

⁴⁵ Nunavut Impact Review Board, “Screening Decision Report NIRB File No.: 13UN035,” January 23, 2014, accessed March 12, 2014, <http://ftp.nirb.ca/01SCREENINGS/2014%20DECISIONS/12.4.4%20SCREENINGS/13UN035Arctic%20Fibre%20Submarine%20Cable/140123-13UN035-Screening%20Decision%20Report-OT3E.pdf>.

⁴⁶ “Home,” Arctic Fibre Inc., accessed March 12, 2014, <http://arcticfibre.com/>.

⁴⁷ Jim Bell, “Arctic undersea cable could end Nunavut’s dependence on satellites,”

Nunavut and Nunavik would seem to be getting all the benefits of an incidental connection—an infrastructural geography that just so happens, for reasons of present and future economic expediency and profitability, to pass through their territories. According to Arctic Fibre, a single unit of satellite bandwidth, equivalent to a gigabit, provided by Telesat Canada can cost Arctic consumers up to two thousand five hundred dollars at present. By way of contrast, that same amount of data delivered via the proposed fibre optic cable would cost between one hundred and one hundred and twenty dollars within three years.⁴⁸ What Arctic Fibre would seem to be bringing to these Arctic communities are direct, quasi-immediate connections across internet-, television-, and telephone-platforms, all at a lower cost. In this schematic plan, latency would no longer be an issue. Local residents would be living in tandem, both in and at the same temporalities as Canadian communities to the south—their time lag would disappear, equally across digital as well as material realities.

While the Arctic Fibre proposal has also met with substantial opposition from corporate and government interests in Nunavut with an investment in satellite telecommunications systems, notably from the SSI group, a Yellowknife-based company that owns Qiniq Internet, one of the principal service providers in Nunavut, it nonetheless marks the emergence, for the first time, of a potentially *reliable* telecommunications infrastructure in the Arctic. Yet this seemingly beneficial and anodyne quality of fibre optic infrastructural “reliability,” also signals the emergence and slow concretization of corporate and government actors that had, by dint of circumstance, neglect, disconnect(ion), and self-interest, left these Arctic communities to their own (ontological) devices. The ACIA report makes this clear by framing equal-access to broadband as first and foremost a military and emergency-response problem, and from there, addressing a long list of new federal needs across a number of departments and programs, from the Canadian Coast Guard and Corrections Canada, to Indian and Northern Affairs Canada and NavCanada; while also, and somewhat incidentally, providing a real and symbolic series of media connections to Arctic residents. These governmental “needs,” which range from building a new port for military use, the development of permanent military ground stations to monitor satellite data transfer, and on to the implementation of an Environment Emergency Management System (E2MS) at a northern site, or providing support to the future distribution of “status cards” in local communities, they all signal the expansion of an infrastructural governmentality that can instrumentalize incidental

Nunatsiaq Online, September 24, 2012, accessed March, 12, 2014, http://www.nunatsiaqonline.ca/stories/article/65674arctic_undersea_cable_could_end_nunavuts_dependence_on_satellites/.

⁴⁸ Ibid.

connections such as spur lines.

This governmentality is an instrument that is shaping the ongoing lives of indigenous residents in Arctic communities. It presupposes that the mere fact of indigenous land claims and local forms of government have righted the not so *post*-colonial imbalance between the exigencies of site-specific northern communities and the interests of a more diffuse group of global corporate and government actors that simultaneously extend both social services as well as forms of social sanction that often reorient or negate the stated interests of Arctic residents. Here it is important to examine, following Star and Ruhleder, the ways in which the projection of futural (and existing) infrastructural systems can lay claim to sited ecological-relational practices. Infrastructural “connection,” in being incidental, raises questions around the attendant and often unforeseen relationships that these forms of connection will build in such regions as the Arctic. By consulting with Nunavut’s residents and community leaders to determine where best to place the cable, Arctic Fibre is merely promoting, producing, and ultimately concealing the “existing visibilities” of its infrastructural system, and thereby sanctioning their intervention into these communities’ material environments.⁴⁹ Moreover, these “negotiations of visibility” should include the political and cultural subjectivities that are co-shaping what “connection” means in their lives.⁵⁰ Thus, in this optic, a “politics of infrastructural visibility” for the Arctic can also make sense of the mutually enabling relational interconnections between resource extraction and government services that underpin the development of telecommunications infrastructure.⁵¹

It is in this sense that the building of the Arctic Fibre undersea cable is also an “environmental” issue, in that it points to the ways in which indigenous communities still retain vital if morphing connections to the land.⁵² This is not to claim that this connection exists as a metaphysics, but rather that it is an evolving worldview that has not yet received appropriate or extensively formalized political, economic, and cultural forms of recognition. The incidence of the connection, in this reading, becomes a form of “slow violence” in that it touches on the important ways in which projects of infrastructural connection, much like environmental catastrophes such as climate change, “present formidable representational obstacles that can hinder our efforts to mobilize and act

⁴⁹ Starosielski, “Warning, do not dig,” 39-40.

⁵⁰ *Ibid.*, 41.

⁵¹ Parks, “Around the Antenna Tree.”

⁵² See Hans Carlson, *Home Is the Hunter: The James Bay Cree and their Land* (Vancouver: University of British Columbia Press, 2008).

decisively.”⁵³ When a telecommunications infrastructure is deemed “essential,” a “matter of survival,” whether for the support and perpetuation of military activities, emergency response, or corporate action, the attendant social relationships that get built out from its seemingly inevitable implementation need to be examined for inequalities by asking who will benefit, how, and when? “We need to account for how the temporal dispersion of slow violence affects the way we perceive and respond to a variety of social afflictions,” Rob Nixon writes.⁵⁴ When it comes to infrastructure in the Arctic, incidental connection may be just such an affliction.

Friction

Friction emerges. Anna Tsing’s conceptualizing of a metaphorical “friction” is a useful device for slowing down subject-object relations in a given time and space. This shifting of speeds, when it comes to Arctic telecommunications infrastructures, is important as the infrastructural pace of northern development is framed in terms of being both urgent and overdue—“catching up with the times” can sometimes conceal much. To examine such diverse actors as the Digital Indigenous Democracy project, Telesat Canada, and Arctic Fibre Inc., requires investing in a politics of the delay that is an attempt to understand how communities can and do come to cohere in a non-teleological fashion. This delay could be a situation specific to late capitalism, in that communities, especially those in supposedly remote regions, seem under greater pressure to succumb to international networks of trade, particularly around natural resource economies dependent on fluctuating production cycles.

To move out of the teleology of “development,” “connection,” and “economic progress,” is not to sidestep the evolution of a networked, non-essentialized indigeneity that is in constant flux in Arctic communities. Rather, it is to acknowledge that there are real, metaphorical, and ontological frictions that adhere to the implementation of telecommunications systems that are framed as being equitably beneficial across the spectrum of a societal conjuncture. This recognition could make more room for thinking about the discursive and political instabilities of post-colonial infrastructures that go beyond dams and roads, and can begin to incorporate telecommunications systems reliant on satellites, fibre

⁵³ Rob Nixon, *Slow Violence and the Environmentalism of the Poor* (Cambridge, Mass.: Harvard University Press, 2011), 2.

⁵⁴ *Ibid.*, 3.

optic cables, and microwave transmitters.⁵⁵ Thinking about these infrastructures as part of a post-colonial spatial politics for the present might also, on the level of method, call for more experimentation and cross-disciplinary affiliations. Lisa Parks and Nicole Starosielski have foregrounded the open methodological questions and possibilities raised by the study of communications infrastructure, yet these are, precisely, generous and open questions that are calling for more attention and generative forms of scholarly practice that attend to the temporal, social, and phenomenological conditions of emergence and lag that many indigenous communities are grappling with today.

In working through a series of “tele field notes” in this essay, I wanted to acknowledge how forms of fieldwork inspired by, if not strictly adhering to, anthropological methodologies might offer just such generative practices that can allow for the site-specificities of infrastructural connections to emerge. These field notes “at a distance” have prepared the ground for my undertaking “fieldwork” (of a kind) throughout the Canadian Arctic in order let these emergent cases of friction cohere across the continuum of actors involved in a literal “broadband” of sited interests. This bridging of distance, and, in the process, spending time in the thick of the Arctic’s infrastructural moment, is important in that it not only complements the documentary and mediating biases of reports, the news media, scholarly production, etc., but also, for the communications scholar in particular, allows for understanding to potentially come into being through, if not participant-observation, then a sited experiential dimension that might disrupt the often stabilizing semiotic and political narratives of the Canadian telecommunications industry.⁵⁶ This method has a marginal if both recent and relatively distant tradition in the study of Canadian communications, with the latter perhaps best embodied in Harold Innis’ “dirt research.”⁵⁷ Yet how, unlike in Innis’ smoothly dense descriptions of incremental

⁵⁵ A recent example includes Julia Tischler’s *Light and Power for a Multiracial Nation: The Kariba Dam Scheme in the Central African Federation* (Basingstoke: Palgrave Macmillan, 2013), however one of the best known books that addresses this question is Arundhati Roy’s *The Cost of Living* (New York: Modern Library, 1999).

⁵⁶ See Darin Barney, “To Hear the Whistle Blow: Technology and Politics on the Battle River Branch Line,” *TOPIA: Canadian Journal of Cultural Studies* 25 (Spring 2011): 5-28; and Peter van Wyck, *The Highway of the Atom* (Montreal: McGill-Queen’s University Press, 2010).

⁵⁷ See William Buxton, ed., *Harold Innis and the North: Appraisals and Contestations* (Montreal: McGill-Queen’s University Press, 2013); Jody Berland, *North of Empire: Essays on the Cultural Technologies of Space* (Durham and London: Duke University Press, 2009); and Charles Acland and William Buxton, *Harold Innis in the New Century: Reflections and Refractions* (Montreal: McGill-Queen’s University Press, 1999).

and decisive societal change, to make the “dirt” show?⁵⁸ In other words, how to allow for the contest of subject-object relationship making to be captured with a valence approaching that of a discursive documentary photograph? How to describe living emergent frictions?

Paul Rabinow, in a 2007 Preface to *Reflections on Fieldwork in Morocco*, a “classic” of scholarly anthropological literature originally published in 1977, looks back to when he started writing the book and how at that time ethnographic fieldwork, while an obligatory “rite de passage” for every anthropologist, had more or less attained the status of a taken-for-granted method.⁵⁹ It was what anthropologists did. *Reflections* caused a scandal amongst anthropologists because in it Rabinow lifted the veil on how, why, and under what circumstances the anthropologist conducted fieldwork. He turned a documentary lens on the natures of anthropological fieldwork and in the process quite literally showed what values cohered in “being-there.” While Rabinow has since turned to a more Foucauldian engagement with the anthropologization of philosophy,⁶⁰ this early work is valuable here because it shows that “fieldwork” is not a constrained or circumscribed practice. Rabinow’s “fieldwork” renders the marks of its making visible. As such, to write a politics of infrastructural visibility into being for the Arctic requires living its infrastructures’ social practices and sited technologies. This entails going beyond the visual in order to document how such phenomena as bandwidth speed, data delays, and other communicative marks of incidental connection are lived across communities in the Arctic by asking: how are infrastructures peopled? It also entails going there, not as an observant outsider, but as one more relation in the field of actors, issues, interests, and geographies that are co-shaping an infrastructural relationality that is fast becoming unproblematically indigenous.

⁵⁸ See Harold Adams Innis, *The Idea File of Harold Adams Innis*, William Christian, ed. (Toronto: University of Toronto Press, 1980).

⁵⁹ Paul Rabinow, *Reflections on Fieldwork in Morocco* (Berkeley: University of California Press, 2007), xi.

⁶⁰ See Paul Rabinow, *Essays on the Anthropology of Reason* (Princeton: Princeton University Press, 1996), and *Marking Time: On the Anthropology of the Contemporary* (Princeton: Princeton University Press, 2008).

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