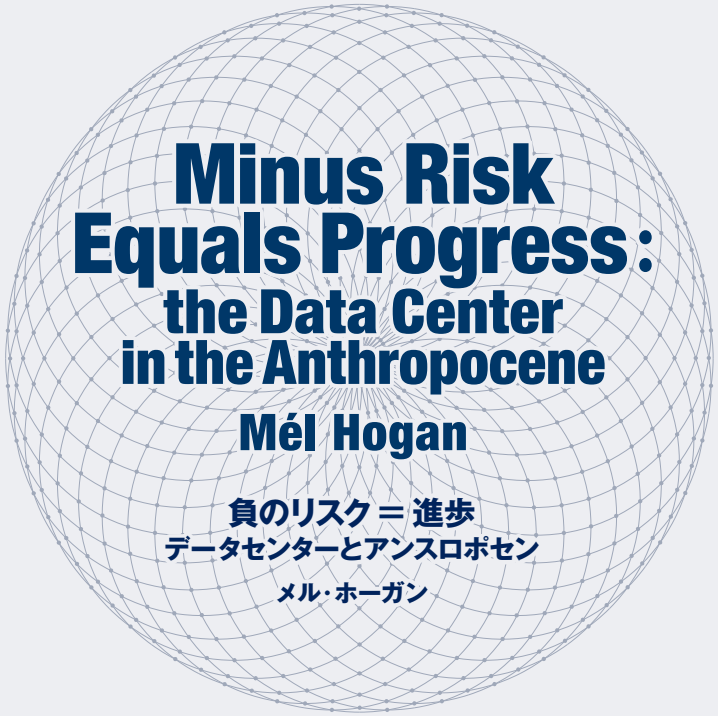

Minus Risk Equals Progress: the Data Center in the Anthropocene

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負のリスク＝進歩 データセンターとアンスロポセン

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The Anthropocene is a well debated set of narratives that speaks to myriad views about the growing tensions between Human and Nature. But who or what is to blame for it? What is to be salvaged of our ever expanding media ecologies? How does risk become the currency of progress? One example that speaks to these questions is the recent plan to lay internet cables in the Northwest passage, linking Japan and the UK by way of the Arctic seafloor. In that context, the future imaginaries of the internet cable foreshadow how risk—natural disasters, political instability, etc.—becomes the global currency of technological progress.

アンスロポセンとは、増大し続ける人類と自然の緊張関係をめぐる無数の意見に対する一連の入念な議論である。しかし、この議論において責任を負うべきは誰、あるいは何なのか？ 膨張を続けるメディアの生態系から、何が回復されるべきなのか？ そして、なぜリスクが進歩のための共通イメージとみなされるにいたったのか？ これらの問いをめぐる一例として、北西航路におけるインターネット基幹線の敷設計画がある。北極海底を経由して日本とイギリスをつなぐものである。本稿では、このインターネットケーブルの未来像を検討することで、自然災害や政治的不安定といったリスクが技術の進歩を推し進める現状と、私たちがなし得る環境へのさらなる取り組みについて考える。

Rather than a consilient concept, the Anthropocene is a well-debated set of narratives that speaks to myriad views about the growing tensions between Human and Nature. Scholars, activists, and artists alike are decrying the abuses of our current geological era that are leaving the planet in an increasingly disturbed state. The dual question of perpetration and perpetuation is at the heart of where we currently find ourselves in the Anthropocene: Who or what exactly is to blame for it? What are its origin stories? What roles do capitalism and imperialism play in climate change and global warming? Whose voices matter in environmental and economic policy? What, if anything, is to be salvaged of our ever expanding media ecologies? And finally, how does risk become the currency of progress?

Dissatisfied with the idea that all humans—regardless of where we are and what kind of social standing we have—are responsible for the fate of the planet, composite perspectives locate instead the important links between labour, power and materiality that speak to the concept of the Anthropocene. To do this, attention turned toward qualitative inquiry—toward more specific, small scale, or 'small data' projects; even for the study of large scale questions. These implicitly oppose positivist traditions, especially where Big Data endeavours to crunch numbers to predict the future.*1 In this way, small data projects serve anew the epistemic call to resist (if not altogether avoid) all-encompassing theories and universal claims that reinforce the binary of Nature vs. Humanity that have created the very conditions for the Anthropocene. This process may instead reveal a repetition of trajectories, desires, and narratives of progress that decolonize human and nonhuman agency in relation to ecological thinking.

As a critical communications scholar documenting the environmental impacts of internet infrastructures, my site of research has been 'the data center' writ large—as a monument to Western priorities and as the archive's underbelly.*2 But my curiosities lie also with the affective qualities of memory infrastructures. In other words, I attempt to document and theorize why and how we come to care about the materialities of communications infrastructure; what does it say about us politically and historically? Most crucially, how did we come to normalize infrastructure space—the natural and virtual—as remnants of a transaction between corporate risk and technological progress? And what can 'progress' even mean in a context of the Anthropocene, where nothing (but capitalism itself) thrives?

While it is impossible to answer these questions in a straightforward way, I look to the data center in the Anthropocene to expose these concerns and reframe the binary of Humanity vs. Nature. One example that speaks to this particularly well is the recent plan to lay internet cables in the Northwest passage, linking Japan and the UK by way of the Arctic seafloor. This plan also entails locating landing sites and data centers in their proximity. This example is important because it brings into conversation data center real estate decisions with the environment, natural resources, and the weather. In this context, how future imaginaries and potentialities about this internet cable are framed foreshadow how risk—natural disasters, political instability, etc.—becomes the global currency of technological progress.

As most news stories and industry boldly report, this northern fibre optics cable-laying endeavour is possible because of global warming; the very idea of it is a project of the Anthropocene. Global warming is melting the Arctic ice, opening up the waters to myriad industries, from transportation and tourism to communications. In return, these activities of capitalism are also literally changing the physical world in ways that makes its own operation more possible. Explained in part in terms of 'feedback loops,' this example demonstrates the interplay between commerce and climate, a world where they constantly reimagine and reshape one another.*3 'Ecology' explains this concept and connection perfectly, where stable environments are created, and then actively maintained by humans as spaces that fit certain (but shifting) ideals of stability and naturality. 'Feedback loops' help us understand this perpetual movement, whereby the Arctic is being opened up to new industry in large part because of industry's inherently exploitative notion of progress that reframes nature to suit its needs.

First the Cables...

Plans to lay internet cables in the Northwest passage began to appear publicly in and around 2012, generated by the Toronto-based company Arctic Fibre Inc. In May 2016, and before any cables have been laid, Arctic Fibre was bought by Anchorage-based Quintillion Subsea Holdings LLC.*4 In industry terms, these Arctic cables are notable for their potential to increase connectivity in terms of speed and reduce costs, especially for those who own the infrastructure. This cable would transmit data from Tokyo to London, making it the most efficient connection to date. What this quest illustrates—perhaps more than anything—is that colonial imaginaries of the unexploited North persist. This Arctic 'shortcut' means connecting one large wired city in Europe to another one in Asia, but not necessarily the northern communities along the way, regardless of how the project is pitched and sold to the public.

Currently, the parts of the Canadian North that are connected are done so by patchwork solutions combining satellite, microwave, and wireless technologies. Culturally, the Inuit are very much invested in equal access to the internet for its various communities, which means that prioritizing connectivity at certain landing sites, where the population is larger, does not suffice in the mission to "connect the North." To the Inuit, connecting the North is very much about opening lines of communication between northern communities, in a vast geography—not just linking north to south.*5,6 Despite this, the melting Arctic ice is accelerating the speed at which new corporate visions for the North are informing emergent dominant discourses: that as long as environmental concerns are addressed, alongside corporate interest, it can be business-as-usual. The uncertainty about who owns the infrastructure and how plans are made in the North is also part-and-parcel of the consequence of global warming that will transform the landscape, and displace entire populations, because of rising sea levels.

The Arctic Council, an intergovernmental forum that addresses Arctic issues, is arguably the most important player in this story. It sees to the cooperation of its various stakeholders, which include "Members"—those countries bordering geographically on the Arctic. Arctic indigenous peoples are considered "Permanent Participants" while others can vie for the status of "Observer"—such as France, Germany, The Netherlands, Poland, Spain, United Kingdom; and more recently, China, Italy, Japan, Korea, Singapore and India. As Arctic blogger and geographer, Mia Bennett, reported on the issue in 2014, much of this posturing by countries signals the growing importance of the North as both passage and platform for future commerce.*7 Singapore, for example, spins its interest more in terms of a relationship with the North for the sake of global survival (though it also benefits from the commodity chain), while China more

overtly looks to partnerships with Member countries in order to exploit Arctic hydrocarbon resources and economically critical minerals.*8 In addition to the Arctic Council, conferences and working groups about the Arctic abound, bringing together oil and gas companies, shipping experts, and ecosystems management groups to parse out the impacts on marine life, to survey Arctic Indigenous communities, to talk about investing in hydrographic, meteorological and oceanographic data, and to draft offshore drilling guidelines.*9 As evidenced by these gatherings, controlling the Arctic—and its seaways in particular—could mean controlling the future world economy. It is also increasingly evident that industry seizes environmental change as an opportunity for development rather than sign and signal to downsize or to altogether retreat. There is now little space to retreat from anyway, as impacts reverberate globally. No matter how obvious the connection between global trade and disease and pollution become, technology—as communication or transportation—absolves itself of its role in impacting the environment.

Big Tech—defined as the aggregate of large and successful communication technology companies with important economic, political and social influence—functions to this effect in a two-fold manner. One: Big Tech is a monopolistic *merchant of memory,* an aggregate of companies of vast material infrastructure toiling for the perpetual accumulation of user data — on health, spending habits, and location. And this Big Data requires big storage. Two: Big Tech sits in the position of savior and custodian of the planet by driving home the idea that technology will save us from our current environmental conundrums, if only we invest in it enough — in its Big Data analyses, and in maintaining and expanding its vast material and immaterial infrastructures. These infrastructural projects are made possible foremost because of the value of opportunity in and of itself—by this logic, the potentially catastrophic melting of polar ice is an excellent "opportunity."

….And Then the Data Centers

Despite the conveniences of our seemingly wireless world, Big Data requires big infrastructure to relay and store the ever-growing data generated by the internet (namely in technology, entertainment, insurance, healthcare, energy, finance, and telecom industries). The aggregating of data centers in locations that are deemed politically and environmentally stable has played a big part in the shift to fewer, but larger, data centers being built. This means more "Mega" data centers are being constructed to host cloud services, but also and consequently, more micro mobile "Edge" (of-network) data centers that function as geographical inbetweeners. Together, these sites occupy large swaths of land and depend on a proximity to natural resources like water as well as cool outdoor temperatures. Some places like Iceland or Sweden's Node Pole follow this logic while others—such as the major hub in northern Virginia (US)—rely more on pre-existing infrastructure, that is "abundant fiber, cheap and reliable power… and attractive tax incentive programs."*10 As infrastructure chronicler for *The Atlantic* Ingrid Burrington has also noted, data centers are built along former trade routes, power grids, or railroad tracks and often grow in the confusing context of market stability born of the economic downturn in other local industries.*11 At this point, we can only imagine that what the Arctic might offer the data center in terms of opportunity, by way of its natural cooling, it might take back in terms of the risks posed by the rapidly changing conditions of the North, questions of sovereignty, and the lack of existing infrastructure. Much of data center infrastructure depends on climate and temperature for their installation, maintenance, and day-to-day operations. These same factors, namely geography, temperature, and climate, also function to rank locations according to a global data center "risk index" (alongside other factors such as the cost of energy, international bandwidth, tax incentives, and political stability—also all factors arguably influenced by global warming).*12

Risk Ecologies

As argued in a recent issue of the *International Journal of Communication* dedicated to media and temperature, outside conditions function as observable states that are captured by measurement and experience.*13 In the case of the Northwest passage, the water is in a frozen state. But the frozen water is also in motion, breaking, and calving. To us, it seems unstable, unpredictable, dark, thick, impenetrable. The water seems both like a path and like an obstacle, both opportunity and risk. We are unsure

whether the water is constitutive of the environment or has become the medium proper of the Anthropocene.*14 While, as Starosielski explains, in certain cases, the cold has been pitted against heat for its inability to transmit—"for a medium, to be cold is to be off, to lack the ability to transfer information"—for data centers, servers overheating is the biggest and most self-generating threat. Instead, a "deep freeze" is sought (Figure 1). And it becomes more than analogy for Big Tech's quest to store and preserve memory.

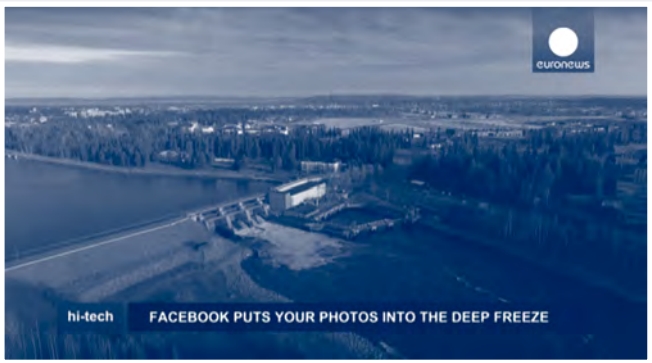
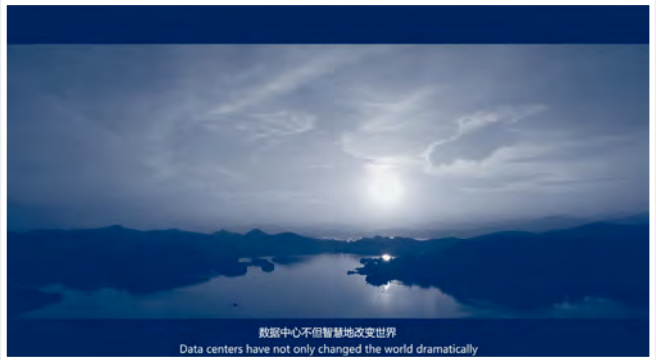


Figure 1: Screengrab from Facebook boasts green data centre in Luleå, Sweden https://www.youtube.com/watch?v=R8w3_gcMw0I

In the realm of environmental assessments, so-called "natural disasters" are the main factor in determining the viability of location of data centers — more so than internet connection speeds (for which South Korea is by far the fastest).*15 Because of this, Iceland, Norway, Switzerland, Finland, Sweden and Canada rank as the top places for data centers in contrast to, for example, Japan in 13th and China in 35th. Why are Japan, and China especially, so low? Because China has "frequent typhoons (about five per year along southern and eastern coasts) damaging floods, tsunamis, earthquakes, droughts, land subsidence," and Japan has "many dormant and some active volcanoes, about 1,500 seismic occurrences (mostly tremors) every year, tsunamis, and typhoons" according to a global Data Center Map dedicated to mapping potential "natural disasters" for the industry.*16 Arguably then, only as long as the data center industry understands itself as outside of the environment are these logics able to frame and measure risk in this way. However, by making the link between tax breaks, deregulation, and climate change the issue of the data center in the Anthropocene instead becomes about how to measure the risk of data centers onto the environment, and how to measure impacts on local economies. By flipping the equation around to measure the impact of data centers on the environment rather than the locational viability and volatility of data centers based on environmental stability, we can begin to ask different questions about the formations of infrastructural spaces as complex media ecologies. *Minus risk equals progress* is a broken formula. It is no also longer viable to understand Big Tech through the perceived opportunity, potential, and affordances of Big Data to "protect the earth in an intelligent way" (Figures 2 and 3).



Figures 2 and 3: Screen grabs from AliCloud's New Energy-Efficient Qiandao Lake Data Center https://www.youtube.com/watch?v=YX4RIdxjIQY

The growing tension between global warming and this quest for cold storage by Big Tech serves as only one example of how data centers are foremost infrastructural imaginaries in constant negotiations with their environments, searching out a stability that is never natural, always constructed. The Arctic presents us with a renewed fascination with opportunity (minus risk equals progress) because our Big Tech imaginaries are always colonial visions that depend on a conception of the environment as being in perpetual equilibrium managed by humans. Even as fabrication, it is an unsustainable one.

In sum, the data center in the Anthropocene (including its vast material network of cables and wires, boats and sensors, landing sites and towers) asks us to scrutinize in a much more profound and poetic way that which connects the materiality of global communications to bodily selves, whoever this collective "we" ends up being in the story of humanity in an era largely defined by the unequal effects of global warming and ensuing environmental disasters in the Anthropocene. 5

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