

ARCTIC AS TERRITORY

instrumentalization of offshore urbanization towards Arctic agency

master thesis

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Colophon

June 2026

Delft University of Technology
Faculty of Architecture and the Built Environment

MSc Architecture, Urbanism and Building Sciences
Track: Urbanism
Graduation Cluster: Critical Environments - Material Ecologies of Care

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Urbanism

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Figure 1. (front page): Digital terrain model of the Ural Mountains meeting Novaya Zemlya in the Russian Arctic.

With the word 'territory' deriving from 'terra', or earth and land, have we set ourself up never see the ocean as one?

And if so, must the ocean be of mechanized ground to be recognized first?



Figure 2. Small offshore platform in the sea (Photo: Heck, 2025).

Abstract

The Arctic is increasingly under pressure from intensifying anthropogenic forces, particularly the expansion of extractive industries and associated infrastructure into previously inaccessible maritime zones, including along the Northern Sea Route (NSR). These developments are accelerating a shift from the Arctic as a largely remote cryospheric system to a strategically integrated corridor of shipping, resource extraction, and geopolitical competition. The rapid and uneven expansion of industrial activity in these waters reflect a broader problem of providing agency to territories beyond the Westphalian system.

Methodologically, the Arctic was conceptually established as a territory beyond Westphalianism through the concept of territoriality by Gilles Deleuze and Félix Guattari. From there the material and expressive components of the territorial assemblage were investigated. A biophysically-based counter-force to the anthropogenic intrusion of the NRS was then configured through existing offshore infrastructure.

The main design results from the transit field were 1) a nodal-based border could operate as an Arctic boundary in alignment with its non-Westphalian nature and in collaboration with Westphalian governance systems, 2) a the most effective means of responding to the intrusion of NRS is by confining it close to shore, 3) the establishment of an anti-EEZ from the nodal positions would strengthen the balance along the marine-terrestrial (eco)nomical transect.

These findings open up broader questions regarding the reconceptualization of territory beyond Westphalian sovereignty, and suggest directions for further research into governance models capable of addressing overlapping and multi-scalar territorial regimes across nation states and environmental systems.

Keywords:
Arctic Territoriality, Northern Sea Route, Deleuzoguattarian thinking, systems thinking

Preface

This thesis stem from an ontological premise that the Arctic is not a passive and remote geographical entity, to what Arctic exceptionalism has shaped it to be for decades. Rather it is an active force both politically and environmentally. It has never been empty. Its boundary-less and unstable nature expose a critical hole in current modern law-making and zonal frameworks. If something is intrinsically unstable, or undefinable by conventional borders, then how can it be given agency to the power it has? How can it be managed? And in the case of the Arctic, will a neglect to these questions continue the path down to a loss of another common, the cryosphere?

From the perspective of the cryosphere, the tale of the Arctic is a mirrored version of the Antarctic. Internationally managed, in theory, on the basis of land-based political and territorial theory. An entry point which the Arctic, mostly as water, does not have. Its instability and planetary role give it material power, yet is institutionally limited to manifest agency within the our modern Westphalian sovereign system.

And if we were to impose a post-Westphalian system on the Arctic to circumvent this, would that only lead the interests of land bleed into the deep Arctic waters? This thesis does not provide answers to all these questions, but rather explores the broader narratives of what would happen if:

1) the legal recognition of the Arctic change
2) we, as a society, do not

Acknowledgements

To Nikos Katsikis, for grounding the project in sound logics, and for sharing an array of design techniques and concepts that I have yet to fully explore.

To Francesca Rizzetto, for always being able read me and the project like book, and to the many speculative ideas of what the Arctic could be.

Thank you to you both, for seeing the bigger picture when I was lost.

To Taneha Bacchin and Diego Sepulveda, who introduced me to the concepts of bioregional- and more-than-human design-thinking, and to make time for conversations on and beyond the thesis.

To the Critical Environments Cohort, for uncountable hours of discussion on everything between heaven and Earth, and for the shared GIS assistance, laughter and frustration, often on the same day.

To Maria, Allard, Sarah Mae, Anastasia and Alisha for keeping me sane and supporting local ramen restaurants.

To Liam, thank you for letting me occupy the dining table for months during this whole process.

Motivation

Winter has always had a special place for me. Whether it be outdoors, partaking in various activities, or simply walking in the sub-zero. I was raised, knowing that the great and vast wilderness was 'a right of everyone' to explore. Incrementally, that wilderness got built down for cabin developments as the economy grew from offshore extractions in the North Sea. It was a familiar story, and often just ended in a few remarks whenever the holidays came around.

For three years, I lived near the transport hub for the offshore workers on the Norwegian continental shelf. The hydrocarbon industry was such an integral part of the regional economy that you never questioned it. If enough people did, then it just got rebranded. You never saw the platforms from the shore, but their impact were substantial nonetheless.

When I got to the Netherlands, I could see them. At night, a red line of light would clearly indicate how mechanized the sea had become. Concurrently, I would hear about the developments of more hydrocarbon fields in the north, well into the Arctic. Developments which would be strategic for the moment, and for the future in regards to potential shipping routes.

Like how the forest-covered hills gradually got fragmented by roads, with every planned-out line becoming an ecological divider, I saw the same process in the making on a far greater scale. Like any trail in the hills, it would become overused with enough traffic. What we can do on land, is to close it and let the area recover. But on water, who has the right to passage? And who has the right to stop you from passing? Ecological territoriality and our inert route optimalization will not magically stop clashing. And so I wanted to answer: what if we could carve out our path in advance, with more than just the lane for ourselves? Additionally, perhaps in more ways than one, how could we avoid a potential loss of an unrecognized global common, the Arctic?

While there's irrefutable evidence that the Arctic of today will be gone tomorrow, we must take action with the mind focused on the days after that.

Snow and Spruce Forest

Tarjei Vesaas, 1946

[Trans.]

Talk about what home is ---
snow and spruce forest
is home.

From the very start
it is ours.

Before anyone has told us
that it is snow and spruce forest,
it has its place in us ---
and then it is there
the whole, whole time.

Waist-high drift
around dark trees
--- it's here for us!

Mixed into our own breath.
The whole, whole time,
though no one sees it,
we have snow and spruce forest with us.

Yes, the hill under snow,
and tree upon tree
as far as you gaze,
wherever we are
we find ourselves facing this.

And have in us a promise
about coming home.

Coming home,
going out there,
bending branches,
---and feeling so it flares in you
what it is to be where you belong.

The whole, whole time,
until it's put out
in our inland hearts.

Snø og Granskog

Tarjei Vesaas, 1946

[Ori.]

Tale om heimsleg —
snø og granskog
er heimsleg.

Frå første stund
er det vårt.

For nokon har fortalt det,
at det er snø og granskog,
har det plass i oss —
og sidan er det der
heile heile tida.

Meterdjup fonn
kring mørke tre
— det er for oss!

Innblanda i vår eigen ande.
Heile heile tida,
om ingen ser det
har vi snø og granskog med.

Ja lia med snøen,
og tre ved tre
så langt ein ser,
kvar vi er
vender vi mot det.

Og har i oss ein lovnad
om å koma heim.

Koma heim,
gå borti der,
høyge greiner,
— og kjenne så det fer i ein
kva det er å vera der ein høyrer til.

Heile heile tida,
til det er sløkt
i våre innlandshjarte.



We can read history through the Arctic, as ice is the planet's very own memory bank. When ice is lost, could one say that the land does not remember anymore? Have we now set the planet on a path towards environmental dementia?

Figure 3. Frozen river channel inside a glacier in the High Arctic (by Author)

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Appendix

Introduction

Arctic Encirclement

perceptions
into
narratives
white
frontiers

Institutional regions have precise
boundaries, defined powers and belong to
nation states. Spatial regions, by contrast,
have fuzzy powers, informal derivative
powers and may span across nation states.
'Regionalization' – the process through
which regions develop or acquire new
prominence – is therefore a polysemic word.

Simona Piattoni, 2016,
A 'Macro-regional' Europe in the Making

The Arctic

The Arctic is increasingly emerging as a critical site where anthropogenic expansion and cryospheric transformation intersect. Once conventionally framed as a remote and stable polar frontier, it is now more accurately understood as a dynamic and rapidly changing system shaped by extractive infrastructures, warming-induced ice loss, and intensifying geopolitical interest. This shift is not only environmental but also conceptual, and it require a rethinking of how territory, space, and materiality are produced. Within this context, the Arctic and the Northern Sea Route emerge as a key site for examining how human activity reconfigure physical landscapes and the categories through which they are governed and remembered.

Arctic as an Unrecognized Territory

The Arctic is increasingly constituted as a governed and operational territory rather than a peripheral void. Through expanding regimes of resource extraction, shipping regulation, and sovereign claims over maritime zones, states and corporate actors extend territorial logics into unstable cryospheric environments. However, this territorialisation is no longer limited to fixed land-based sovereignty. Instead, it operates through fluid, overlapping systems of jurisdiction that respond to shifting ice conditions, seasonal accessibility, and infrastructural development. Territory in the Arctic thus becomes less a stable boundary than an adaptive field of control shaped by environmental volatility.

The Arctic Ocean is Urban

Simultaneously, Arctic marine space is being reorganised through infrastructures that slowly mechanize it along the shorelines. Shipping corridors, extraction platforms, surveillance networks, and logistical nodes increasingly structure the ocean as a managed and inhabited environment. Rather than an empty expanse, the Arctic Ocean function as an emergent urbanised fierld, where mobility, resource flow, and governance are continuously coordinated across vast distances and harsh climatic conditions.

Ice is a Fading Memory

At the same time, the Arctic cryosphere operate as a material archive of environmental change. Ice sheets, sea ice, and permafrost store traces of climatic histories and industrial impact, while simultaneously recording their own rapid dissolution under warming conditions. As this cryospheric system decay, it becomes a site of temporal compression, akin to that of a landscape-based memory loss. In this sense, ice functions not only as a physical medium but also as a repository of memory, of one that is actively being destabilised and removed through ongoing anthropogenic intrusion.

The Arctic's territorial problem arise from the intrusive forces across matter, the (sub-/super-)surface and then how it it claimed and managed.

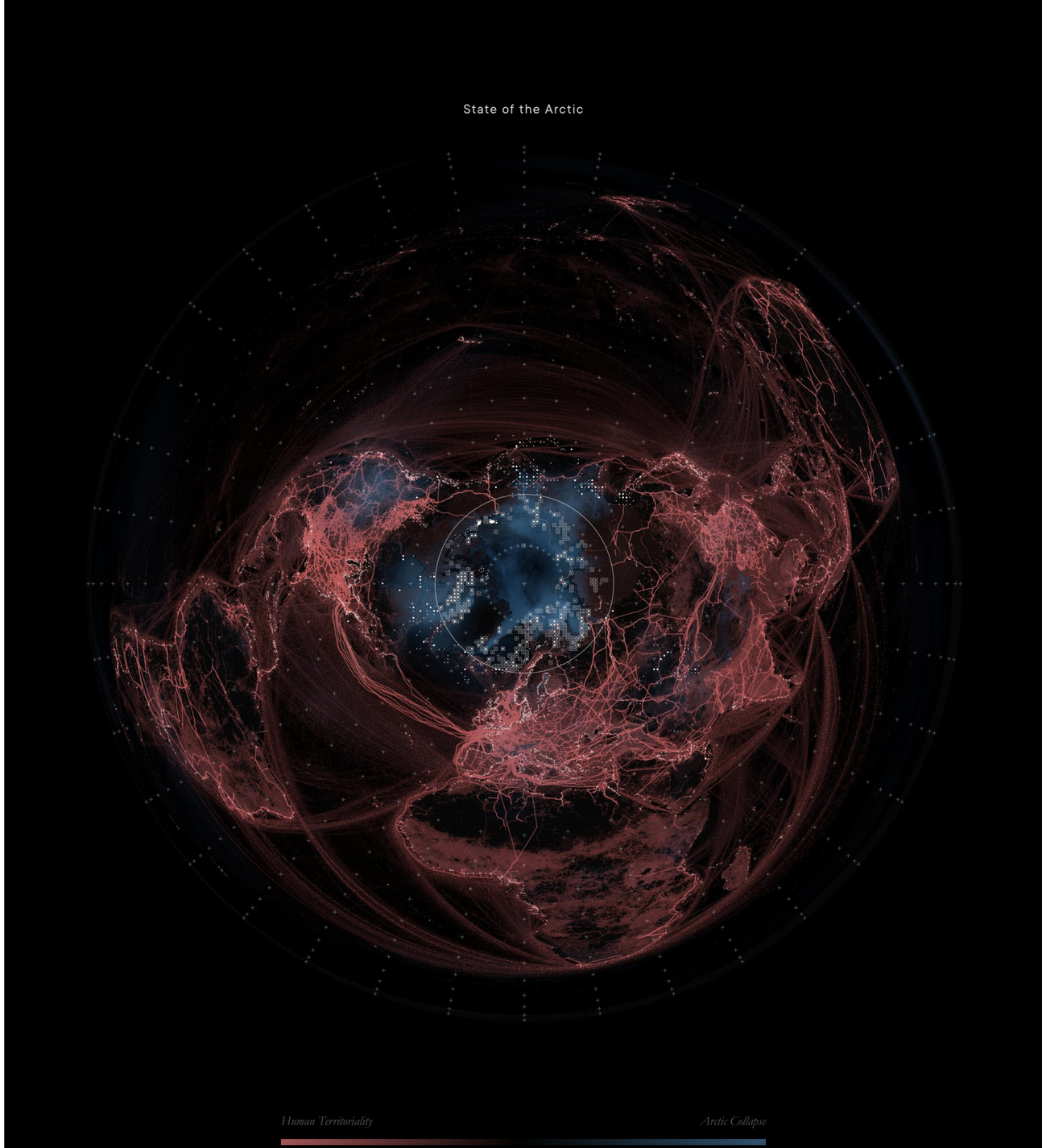


Figure 4. Collapsing state of the Arctic

Subsurface

Extractive Frontier

As of 2026, the Arctic supply roughly 10% of the world's hydrocarbon need, most of which from onshore facilities. In the future, by looking at the remaining reserves worldwide, almost 22% are located within the Arctic. Within that fraction, over 80% is located offshore (USGS, 2008). Developments in the North Sea are already northbound, and arctic nations such as Russia, USA and Canada are all planning offshore developments albeit at slower rates than previous decades (Gulas et al., 2017; Sokkeldirektoratet, 2025; Zhang et al., 2024).

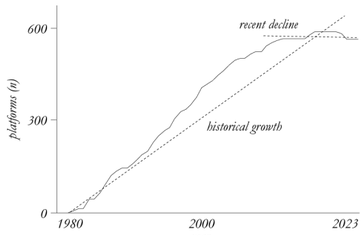


Figure 5. Number of platforms in the North Sea (Martins et al., 2024)

Regardless, the world will by most accounts not reach a decarbonized economy before the first developments in the arctic seas take place. The developmental extent will be speculative, but it is apparent that it will happen and differ from the historical extractive behavior. New and operational platform models such as *Goliat FPSO* are able to adapt and move accordingly to change, which open a range of both options and questions to how the sea will be handled (Sokkeldirektoratet, n.d.). Most importantly, it lay the foundation for seasonal extraction and dynamic extraction sites. Not only does it extend the operative scale of every platform, but it will inevitably amplify the cryospheric breakdown along its maritime edge (Global Fishing Watch, 2025).

In response to the lower low-arctic waters warming up, the aquacultural sector too will see a northbound trajectory. By most projections, the Barents maritime region will experience the earliest signs of becoming 'de-Arctified' or rather 'Atlantified' (Chen et al, 2026).

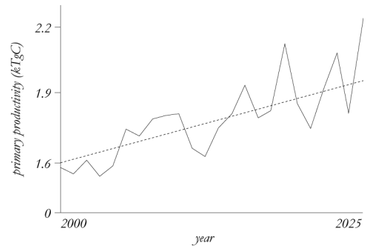


Figure 6. Annual net primary productivity within the Arctic Circle (Frey et al., 2025)

These trends are all but symptoms of a greater sickness looming over the Arctic, that being its perception. The notions of the Arctic will be discussed further in-depth (see page 48-63), but extractivism does not appear out of nowhere. It does however appear in places that is politically perceived and/or deemed as 'nowhere' or 'no man's land', a *terra nullius*. Expendable areas that ultimately have to satisfy the global need through at biased utilitarian view. For the Arctic, this is the pressing backdrop that will drive its future, and whether the extractive frontier is enabled, halted or disbanded completely.

extractivism

/ɪkˈstrakt-ɪv-ɪ-zəm/
noun:

1. socio-ecologically destructive processes of subjugation, depletion, and non-reciprocal relations, occurring at all levels of practices (Chagnon et al., 2022)

2. the political notion for appropriation, commodification, and exportation of raw materials (Cerioli et al., 2025)

frontiersim

/ˈfrän-ˌtir-ˌɪ-zəm/
noun:

1. the political notion in support of expanding frontier operations as constructed zones of extraction, colonization, or technological domination (Smith, 1984)

2. orientation toward boundary zones, whether geographic, technological, or ontological, where expansion, transformation, and instability are valorized and contested (Galton, 2003)

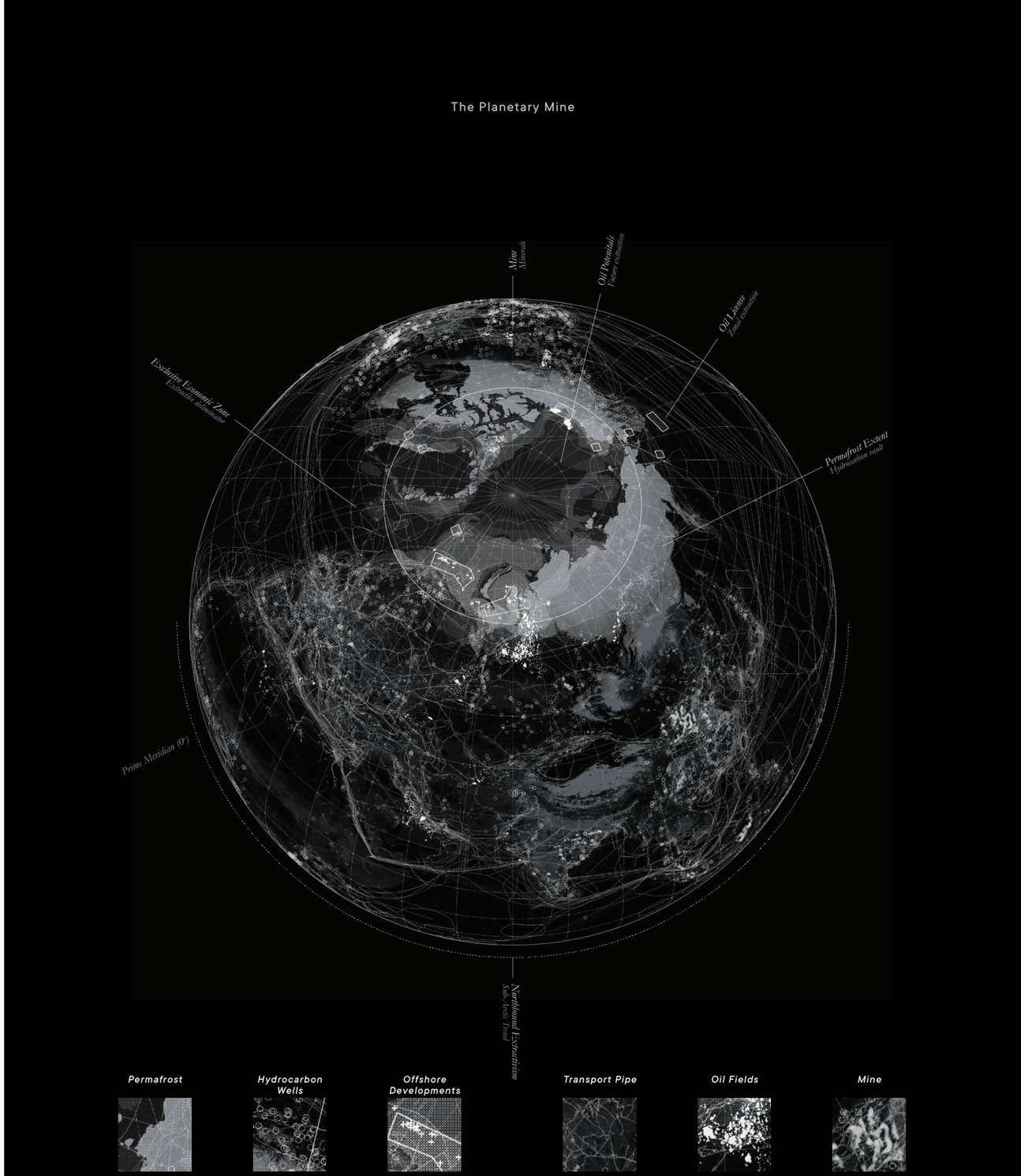


Figure 7. Extractivism enclosing on the Arctic.

Surface

Logistical Corridor

A highly discussed Arctic matter is its future role in maritime trade, as it provide a shorter and cheaper European-Asian connection (Li et al., 2023). Paricularly the North-west Passage is expected to be a lucrative trading highway, as it directly pass by most of the biggest operational harbors of today. While this route, the NSR, currently require ice breakers or non-conventional cargo ships during the summer months, traffic have steadily been increasing over decades. A journey from Shanghai to Rotterdam, two of the biggest export and import locations respectively, through the NSR would reduce the time taken by 10 days, distance by around 7 000 km and ultimately lower overall fuel consumption by 30-40% (Zhao et al., 2016).

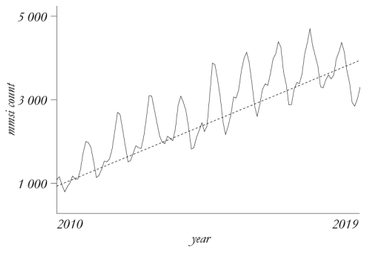


Figure 8. Shipping presence along the North-East Passage (NOAA, 2022)

While the direct distance is significantly lower, the NSR would still for the near future require higher ship maintenance, insurance and overall infrastructure to be both built and maintained along the route (Gleb & Jin, 2021). Strategic investments from both Russia and China have begun to show signs of creating a preliminary route during high-summer, but both geopolitical and environmental challenges have significantly lowered the expected success (Kremlin, 2022; Lamazhapov et al., 2023; People's Republic of China, 2017).

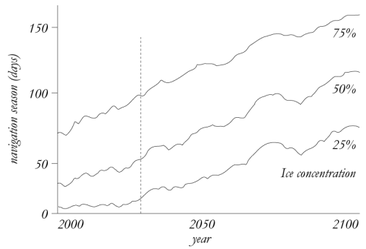


Figure 9. Navigation season along the Northern Sea Route (GRID-Arendal, 2007)

Whether through the eastern or western passage, the NSR will in time make the Arctic into a critical area for freight passage. If unregulated, marine traffic will continue to follow the ice until the route reach an optimum distance-wise (Humpert & Raspotnik, 2012). The 'transpolar sea route', TSR, in that sense is therefore the manifestation of two things:

1. the neoliberal and late-capitalistic world order, and subsequently the performance-oriented society
2. a dominant anthropocentric Arctic ontology

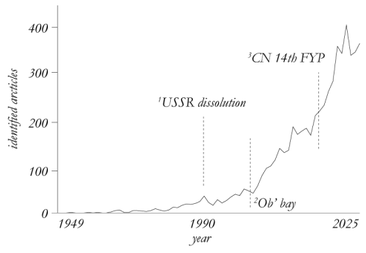


Figure 10. Scopus-related articles on the NRS or Arctic shipping up until 2025. Key historical moments like Ob' bay's hydrocarbon startup and the 14th five-year plan in China are highlighted.

geopolitics

/ˈjē-ō-ˌpä-lə-ˌtiks/
noun:

1. the production of world politics through geographical/ spatial imagination and projections (Dalby, 2000)

2. a historically produced practice of governing and understanding space as territory through political and technical means (Elden, 2009)

neoliberalism

/ˌnēˌäb-ər-əl-zəm/
noun:

1. the policy of supporting a large amount of freedom for markets, with little government control or spending, and low taxes (Cambridge dictionary, n.d.)

2. a process of market-driven social and spatial transformation resulting in path-dependent outcomes (Brenner & Theodore, 2010)

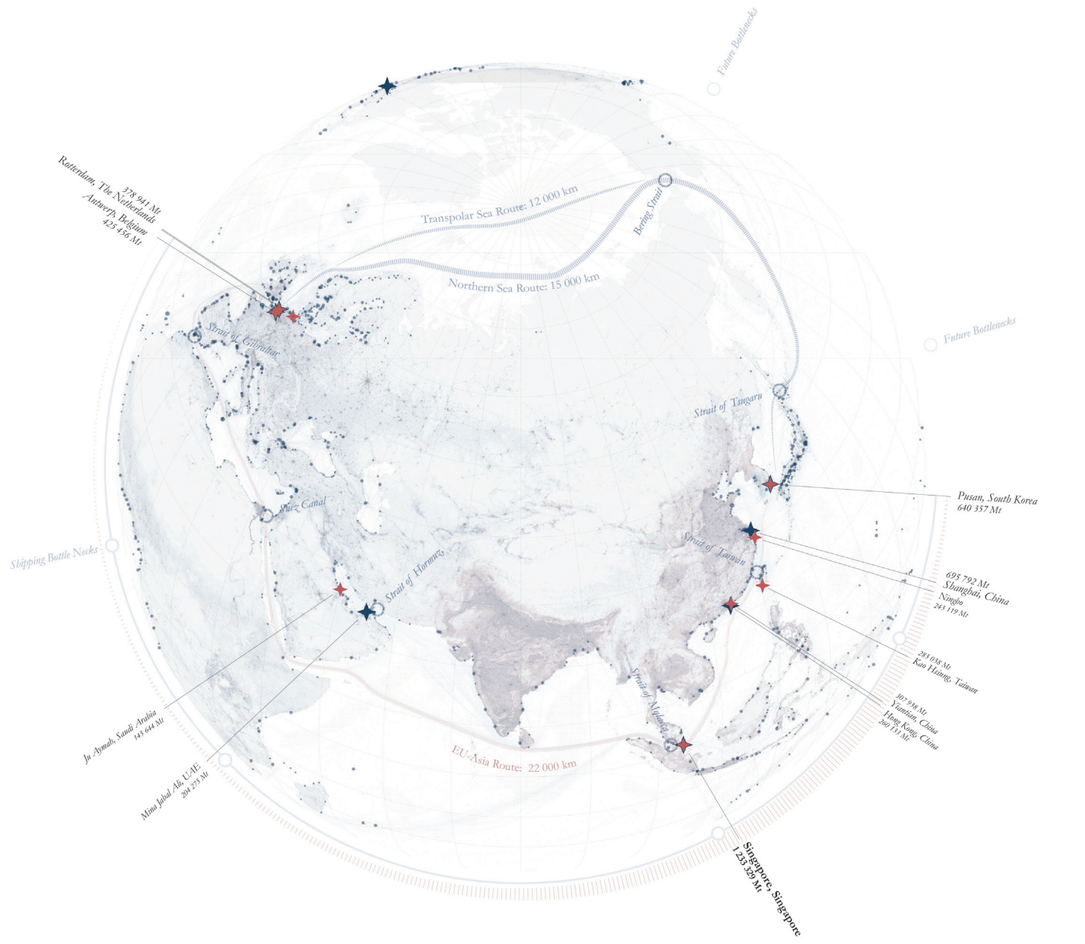


Figure 11. Northern Shipping Route

Supersurface

Temperature Regulator

While historically perceived as a white barrenscape, the Arctic region hold significant power and influence over the Earth's climate (Middleton, 2026; Sörlin, 2015). Much of the airmass over the polar caps are relatively stagnant compared to the Earth, which atmospheric fronts from the Coriolis effects, generate a planetary cooling chamber.

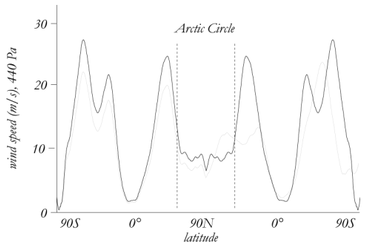


Figure 14. Butterfly diagram of global average annual wind speed per 2025 at 440 Pa (data from ERA5, 2026).

The intrinsic properties of the Arctic atmosphere have recently been exposed as one of the main reasons behind an amplification of climate change. As contaminated southern airmasses flow into the polar cell, it accumulates and trap heat. Combined with ice sheet shrinkage result in a lower albedo, or reflective capacity, and perpetuate a cycle of heat entrapment (Dai et al., 2019; Previdi et al., 2021).

Today, this is a process which is enabled by a global pollution force, but it also regionally strengthened by pollution sources within or close to the polar cell (Lawrence & Lelieveld, 2017). Most regional emissions stem largely from sources such as boreal wildfires, permafrost melting and subsequent release of matter and gases, transport and extractive industries (Čović et al., 2021). As

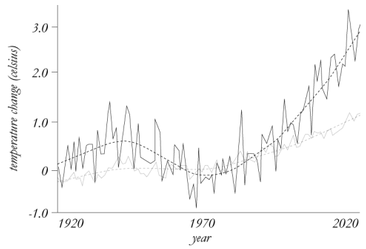


Figure 13. : Relative temperature difference since 1920, both globally (dimmed) and within the Arctic Circle (NOAA, 2022)

already mentioned in previous parts, the northbound extractive developments and maritime activities would be located well within the 'cooling chamber'. Given the prognoses on permafrost decay towards 2100, it is evident that the Arctic will deal with a significant amplification from natural sources regardless (Baillarget & Scaringi, 2025; Slater et al., 2013). The need to rethink not only type, but also extent and location of industrial developments in the Arctic is evident. This prompt the following question: to which extent should climate change, specifically the Arctic amplification, be spatially enabled within the polar cell? With the inevitable change to the bioregion, across earth, sea and air, there's a need to not only adapt but to transform Arctic activities with these systems in mind.

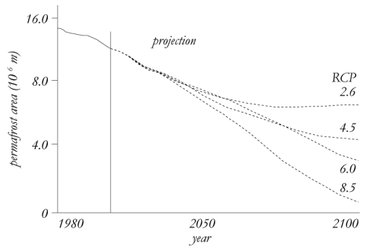


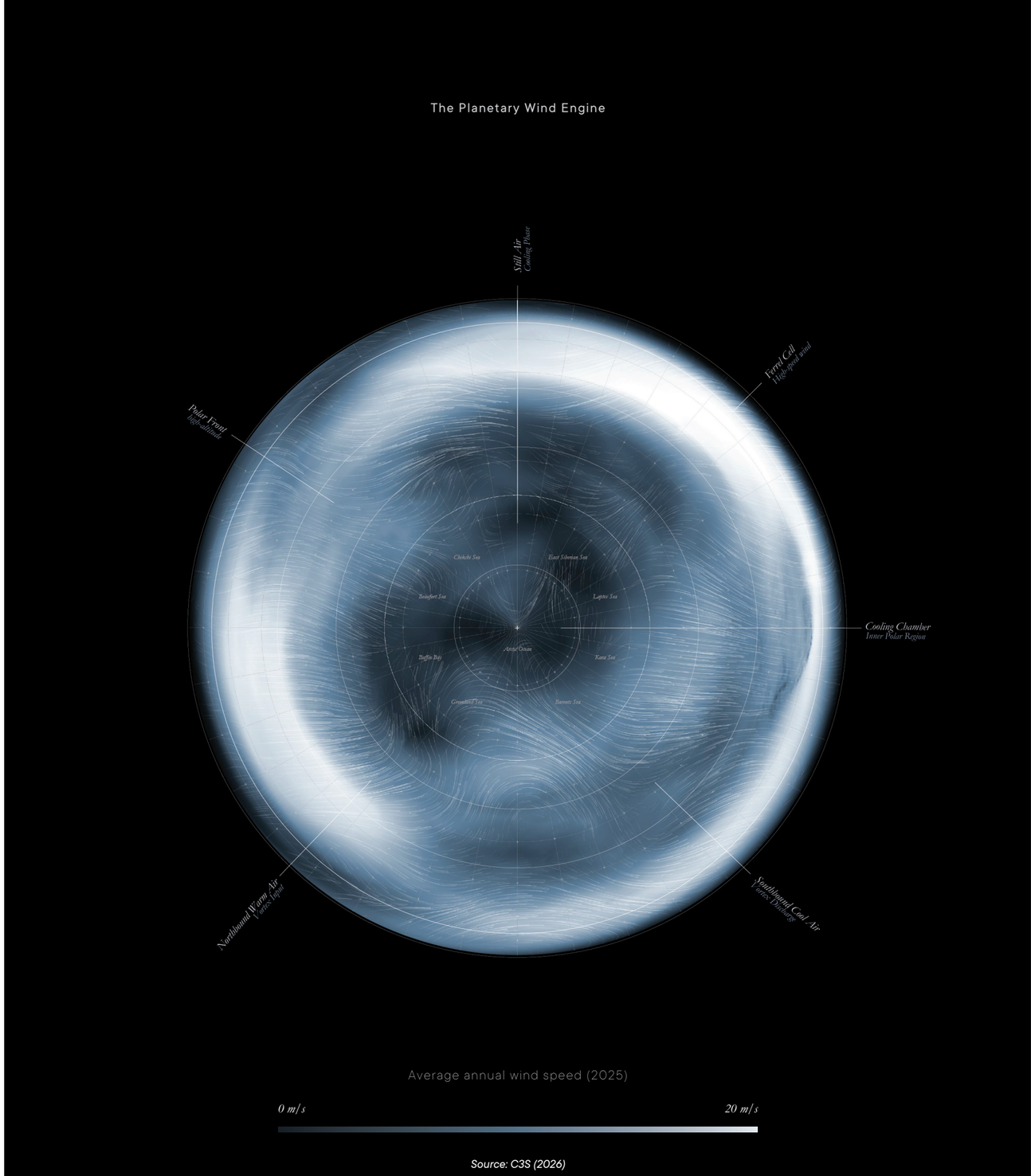
Figure 12. Historical and projected extent of permafrost (Baillarget & Scaringi, 2025)

bioregionalism

/ˌbī-ō-ɪjē-jə-nə-ɪlī-zəm/
noun:

1. the process of delimiting territories to biophysical properties (Karl Burkart, 2024)

2. the treatment of regions as geopolitical entities that are re-constructed through context-dependent socio-political processes (Waldenberger, 2000)



Territoriality

Claiming Matter

Much of the discourse surrounding the Arctic today, and subsequently the management of it, come down to how it is defined and claimed. Through the perspective of the global Westphalian legal system and its nation state organization, and our inert perception of land as primary territory, the Arctic have found itself in a gap of both from its largely water-based body (Wood-Donnelly, 2024; Østhagen, 2020). The sea has over time become an extension of land, or rather an extension of the terrestrial territorial claim, but never a territory of its own. It has, as seen as a counter-space to land, become subjugate to it (Vianello, 2026).

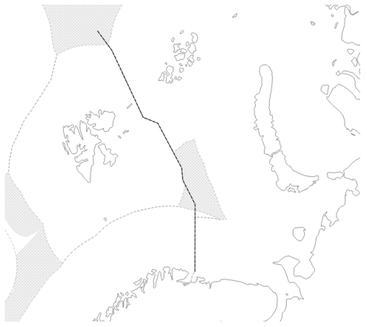


Figure 15. Russo-Norwegian territorial dispute and agreed borders in the Barents Sea. Resolved in 2010 to fill one of the territorial 'gaps' in the Arctic.

This, in part, can explain how Antarctica managed to become a politically recognized global common while the Arctic continue to be contested. Another key reason is the relative de-gree of remoteness between the two. While Antarctica is a completely detached landmass with no historical human inhabitation, the Arctic have on most non-climatic accounts the inverted condition. Paradoxically, the Arctic was for centuries viewed as equally remote and desolate by European powers. The combination of relative proximity, periodic disregard and non-Westphalian territorial conditions make the wider context of Arctic territorial issues.

As a result of post-war globalization and the eventual legal recognition of the seas, again through the same aforementioned biases, UNCLOS was adapted in 1982. Fully known as the United Nations Convention on the Law of the Seas, or more commonly as the 'constitution of the seas', it formalized many terrestrial-marine claims such as the exclusive economic zone (UN, 1982). Today, UNCLOS is the international foundation for any territorial dispute in marine areas. The diagram on the right showcase all the various legal zones and carvings of the seabed, including the main UNCLOS articles related to them. One quick look reveal a pattern of clear zonal fading, inversely proportionate to the distance to shore. The further away the marine environment is from land, the more is it homogenized in law. Another dimension it aim to highlight is how territorial claims differ through matter, and how it ultimately create a territorial volume rather than a plane (Elden, 2013; UN, 1982).

This structural issue perpetuate Arctic territorial disputes. How is a territorial 'hole' larger than Greenland, of around 2.8 million km² compared to 2.1 million km², supposed to be governed if the governance itself revolve around terrestrially-based territoriality? As a product of its unique geopolitical conditions, the Arctic became an experimental site for governance to circumvent these problems (Young, 1985). By today, it led to the establishment of the Arctic Council in 1996 to coordinate developments in the region in a time of peace (Arctic Council, n.d).

territoriality

/ˌter-i-ˌtȯr-i-ˈal-i-ˌtē/
noun:

1. the attempt to affect, influence, or control actions, interactions, or access by asserting and attempting to enforce control over a specific geographic area (Sack, 1983)

2. the formation of an expressive and material bond between to elements of beings (Deleuze & Guattari, 1987)

westphalian system

/ˌwestˈfālēən ˈsistəm/
noun:

1. the modern states-system, based on exclusive territoriality operated by a depersonalized state (Elden, 2013)

2. a geopolitical arrangement based on cartesian reason and logic to determine territorial boundaries (Bauder & Muller, 2021)

Legal Territorial Claims

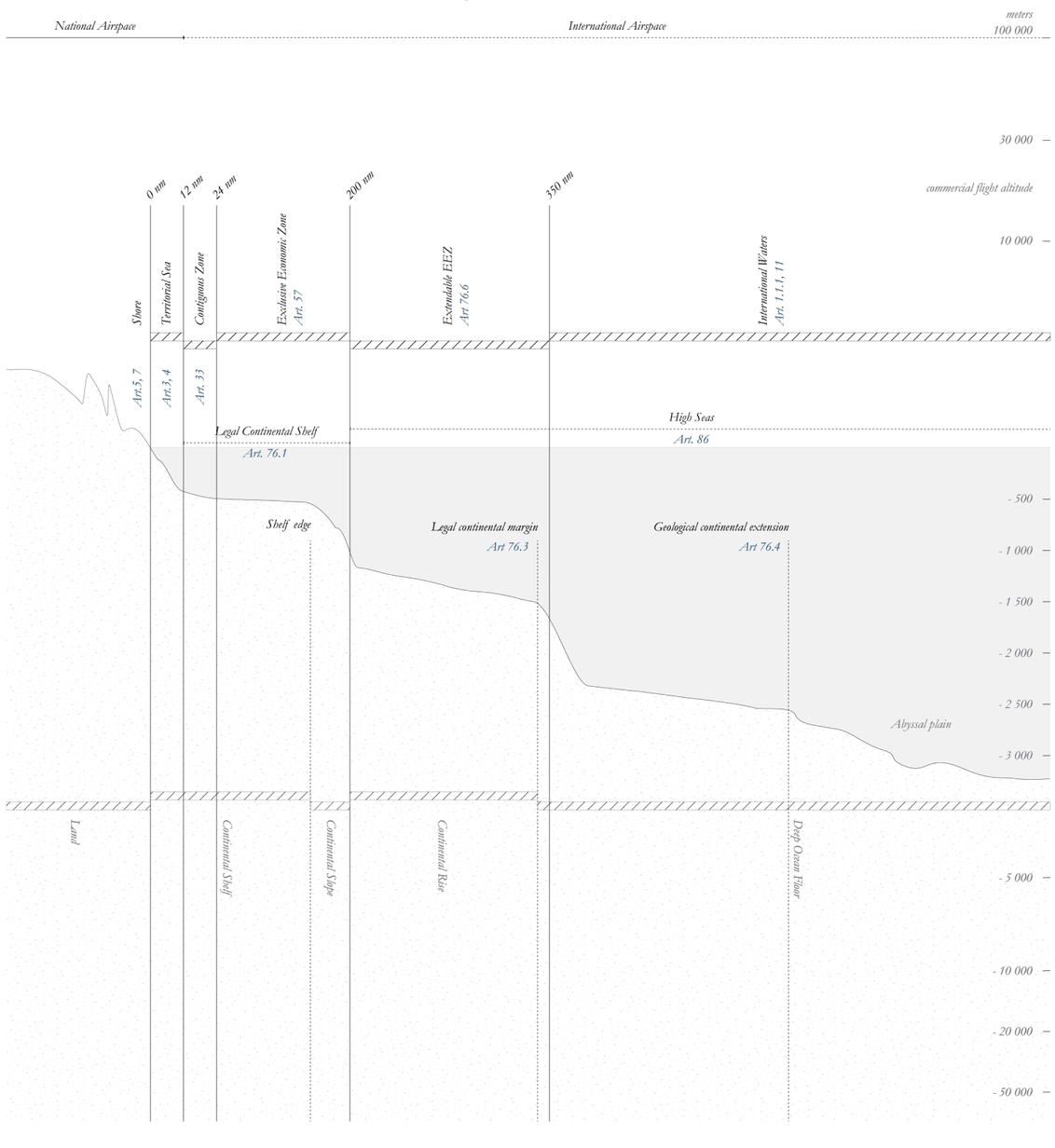


Figure 16. Legal territorial claims through matter (UN, 1982).

Governance

The Arctic Council

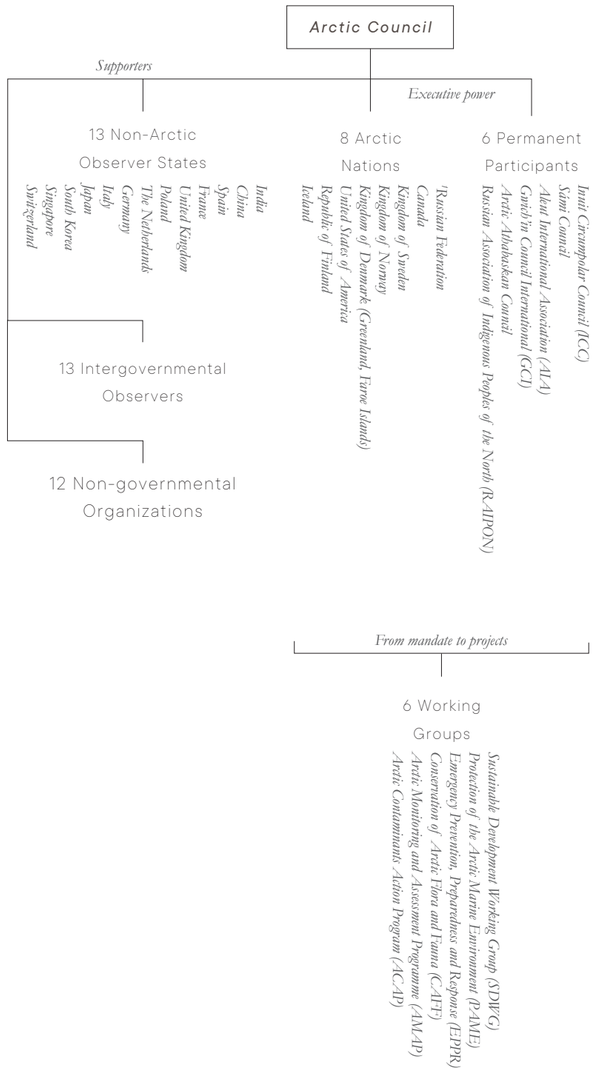
The Arctic Council, founded under the Ottawa Declaration in 1996, serves as the primary forum for cooperation among Arctic states, indigenous communities, and other stakeholders on environmental protection, sustainable development, and scientific research. Its mandate, which explicitly states that it "should not deal with matters related to military security," has long guided its non-military, consensus-based approach.

Yet this structure ultimately revealed its own limitations. The 2022 Russian invasion of Ukraine effectively led to a paralysis within the Council. With Russia as a central Arctic player, internal disputes over sanctions, and decreased political legitimacy stalled projects and froze collaboration with observer states since.

The Council's inability to address and navigate such geopolitical crises has hindered its effectiveness, despite its successes in environmental and economic arenas. This comes along with its own acknowledgement of geopolitics as a main challenge, with the two others being climate change and migration (Arctic Council, 2025).

The current stalemate underscore the fragility inherent in separating mega-regional governance from strategic realities, highlighting an urgent need to reconsider mechanisms that ensure Arctic cooperation throughout future geopolitical turmoil. Without one, as seen, national extractive interest can increase and offset any regenerative efforts by neighboring nations.

Breakdown of the bodies within the Arctic Council



[1]*Membership momentarily suspended.*

Figure 17. Breakdown of the immidiate structure of the Arctic Council

Stakeholder Overview

[1]*Respective definitions of the Arctic are included in the appendix*

Scale of Operation	Category	Stakeholder		Role
International	*Intergovernmental Governance*	*[1]Arctic Council* *Arctic Economic Council* *Barents Euro-Arctic Council (BEAC)* *International Martitime Organization (IMO)*		*Facilitate pan-Arctic cooperation between Arctic states and indigenous communities*
	Indigenous Governing Bodies	*[CA] Inuit Circumpolar Council (ICC)* *[FI,NO, SE] Sámi Council* *[RU, US] Aleut International Association (AIA)* *[CA, US] Gwich'in Council International (GCI)* *[CA. US] Arctic Athabaskan Council*		*Represent indigenous people and their values, cultures, interest and knowledge on international matters.*
	NGO/Civil Society	*World Wildlife Fund (WWF)* *Greenpeace* *[1]Conservation of Arctic Flora and Fauna (CAFF)* *[1]Arctic Monitoring and Assessment Programme (AMAP)* *Protection of the Arctic Marine Environment (PAME)*		*Environmental monitoring, advocacy and/or protection.*
	Research & Academics	*International Arctic Science Committee (IASC)* *University of the Arctic (UArctic)*		*Coordination of Arctic research and education*
	Business & Industry	*Arctic Economic Council* *International Maritime Organization* *Global Maritime Forum*		*Facilitate economical activity and development*
National	*Arctic Nation State Governments*	*[RU] Ministry for the Development of the Russian Far East and Arctic (AARI)* *[CA] Crown-Indigenous Relations and Northern Affairs* *[US] Department of State; Department of the Interior; Department of Commerce* *[NO] Ministry of Foreign Affairs; Ministry of Trade, Industry and Fisheries* *[SE] Ministry of Foreign Affairs; Ministry of Enterprise and Innovation Growth* *[DK] Ministry of Foreign Affairs; Government of Greenland* *[FI] Ministry of Foreign Affair; Ministry of Economic Affairs & Employment* *[IS] Ministry of Foreign Affair; Ministry of Trade, Industry and Fisheries*		*Arctic policy- and strategy-making, and international representation*
	Indigenous Governance	*[RU] Russian Association of Indigenous Peoples of the North (RAIPON)* *[CA] Assembly of First Nations* *[US] Alaska Federation of Natives* *[FI, NO, SE] Sámi Parliament (per nation)* *[DK] Parliament of Greenland*		*National-level indigenous advocacy and self-governance*
	Research	*[RU] Arctic and Antarctic Research Institute* *[CA] Polar Knowledge* *[1][US] National Oceanic and Atmospheric Administration (NOAA)* *[NO] Norwegian Polar Institute* *[SE] Swedish Polar Institute* *[DK] Danish Polar Institute* *[FI] Arctic Centre, University of Lapland* *[IS] Stefansson Arctic Institut, University of Akureyri*		*Country-specific research, data-collection and land management influencers*
Other	*Industrial Companies*	*[RU] Gazprom*	*Oil & Gas*	*Revenue generation of Arctic resources and connections*
		[NO] Equinor	*Oil & Gas*	
		[DK] A.P. Møller–Mærsk	*Shipping*	
		[CN] COSCO Shipping	*Shipping*	
		[RU] Norilsk Nickel	*Mining*	
		[SE] LKAB	*Mining*	
		[FI] Fortum	*Renewable Energy*	
		[DK] Polar Seafood	*Fishing*	
		[US] Arctic Circle Wild Seafood	*Fishing*	

Figure 18. Overview of major stakeholders with an operational scope or interest in the Arctic.

Literature Review

Current Epistemology

Given how the Arctic is more than a geographical location but also an object of knowledge, an epistemic object, it is of necessity to understand where the extent of said knowledge lie. However, the inherent bias from the western scientific model does leave a significant part of native and more informally-documented ontologies of the region. As the literature review is also meant to inform the spatio-temporal analysis by locating key indicators, it was excluded from the preliminary knowledge search (see the methodology on page 48-51 for details).

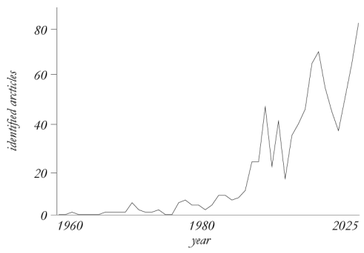


Figure 19. Results before exclusion filtering over time.

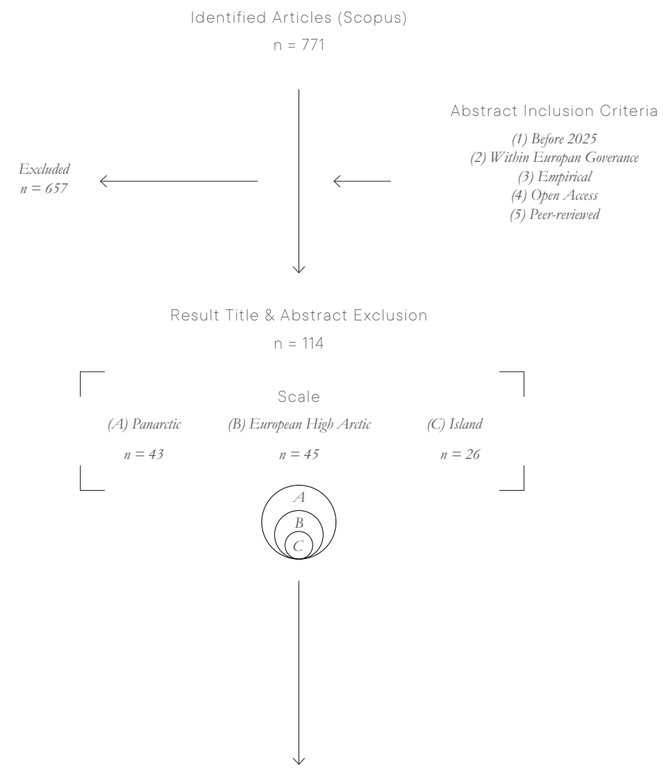
The search yielded 771 results, of which 657 were excluded through a set of criteria listed on the right. Three scales were used in the search, namely the panarctic/ circumpolar, European High Arctic and any autonomous island regions such as Greenland, Iceland and Svalbard. Together they would highlight matters across the Arctic, at its deep-water entrance and on its northernmost settlement. The two largest scales yielded about the same result quantity after second exclusion round, 43 and 45 respectively, while the island-scale yielded around half at 26. The most dominant fields where in descending order: geology (n=56), glaciology and cryospheric studies (n=51), and social sciences (n=48), while the least frequent where economics (n=30), tourism & culture (n=25), and technology & engineering (n=20). Note that these are still among the most prominent groups.

Five of the groups are directly tied to understanding of the material biophysical properties of the region, 3 to the social expressive aspect, and the remaining 2 to the economical aspect. The distribution in high-frequency fields suggest a prioritization of material-physical understandings, as socio-cultural dimensions appeared more fragmented in scope and frequency. This reinforce the Arctic ontology, or notion, of being an inhabitor of resources, rather than native ontologies which were extremely limited in the final selection.

The gap in research is not in the biophysical analysis itself, but rather how it relates to territoriality as a process, and how society emerge on and around it. Most importantly were the lack of an understanding of how Arctic territoriality can emerge through its own conditions, that is through air, land and sea. The territorial mediator in the selected papers were all based on the Westphalian rationale, e.g. the Arctic nation states, which ultimately superimpose or extend itself onto the region.

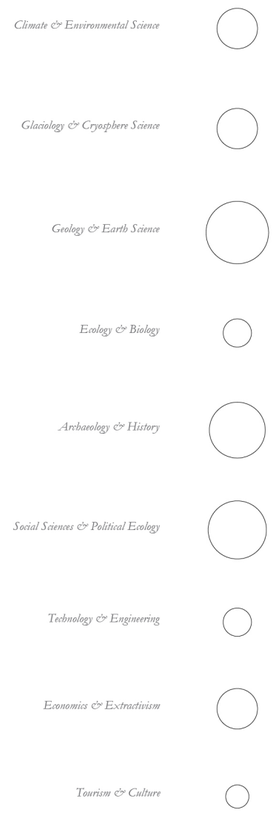
A conceptual gap to see the Arctic as a territory of its own is therefore missing.

Literature Filtering



Thematic Keyword Cluster

1. *(n=83) Arctic / Polar Regions*
2. *(n=42) Climate & Environmental Change*
3. *(n=51) Glaciology / Cryosphere / Permafrost*
4. *(n=56) Geology, Geomorphology, Earth Science*
5. *(n=39) Ecology & Biodiversity*
6. *(n=44) Archaeology, Heritage & History*
7. *(n=48) Social Sciences / Political Ecology*
8. *(n=22) Technology & Engineering*
9. *(n=30) Economics / Extraction / Livelihoods*
10. *(n=25) Tourism, Culture & Experience*



Search Query:

(TITLE-ABS-KEY ((("arctic" OR "circumpolar") OR "European High Arctic" OR "Svalbard") AND "political ecology" OR "more-than-human" OR "myth" OR "planetary urban" OR "natureculture")) OR TITLE-ABS-KEY ("arctic" AND "material" AND "landscape") OR TITLE-ABS-KEY ("arctic" AND ("CRM" OR "CRITICAL MATERIAL")) AND PUBYEAR < 2025

Relevance

Societal

The enduring paralysis of the Arctic Council, the main circumpolar collaborative body, prompt the need to seek other ways of manage the Arctic. Notably, it pose the need to reinterpret the societal, and now legally embedded, notions on the polar region as well. That current ways of Arctic governance was established in an age of relative peace, with the idea that it could be managed by Arctic states alone, need to be reevaluated. The global importance of an operational Northern Sea Route will in the future challenge current governance models well-beyond their capacity. Therefore, before it become reality, there's a great need to address potential solutions both governance-wise and in terms of territorial configurations with projected extractivism.

Other non-extractive industries, such as fishing, are also northbound. With rising activities in the marine environment, and an inherent societal need to provide enough food, one cannot ignore the coming needs to mediate between presence and preservation. The future Arctic corridors must be in alignment with the terrestrial economies and societies, and that will require an environmentally responsive development strategy with long-term foresights.

Scientific

The amplified effect of climate change in the Arctic call for a new understanding of it as a territory of change across scales. This ultimately extend into an investigation of the Westphalian-based governance system, and the gap it has for deeper oceanic spaces. Spatio-temporal mappings are a key point in exposing where the current destabilization are located and the rate. Additionally it can show in which ways the sea has been urbanized.

While research on the Arctic's biophyiscal alterations are extensive, it is rarely assessed across matter and governance alike. Therefore, it is of great interest and scientific relevance to establish an Arctic territorial model which acknowledge both the material and expressive, eg. biophysical and political, matters can be assessed and juxtaposed.

This work will provide a critique to the Westphalian-based framing of the Arctic, and introduce spatial logics for future Arctic offshore developments to mediate marine traffic. Additionally, it aim to provide further insight into marine urbanization and current loopholes.

Ethical

Given the complexity and non-confirmative nature of the Arctic as a region, the work presented will not be able to encompass all local and regional perceptions, values or ideas. The conceptual trap of treating the Arctic as one coherent unit is still a risk despite efforts to avoid it.

Due to the near planetary scale of the mappings, and the general academic Arctic bias in available datasets, indigenous epistemics will not be ideally represented. While occasional informal meetings provided some insights, a deeper understanding would require more time than what was at hand. For data that was publicly available, attempts were made to cross-check any critical claims and link back primary data to a reliable source.

While the work aim to address a matter of concern within the Arctic, it still remain rooted in matters of fact for reasoning. Data availability will directly impact the final territorial configuration of the design, and the missing gaps addressed might still not provide an adequate weight to it in the evaluation.

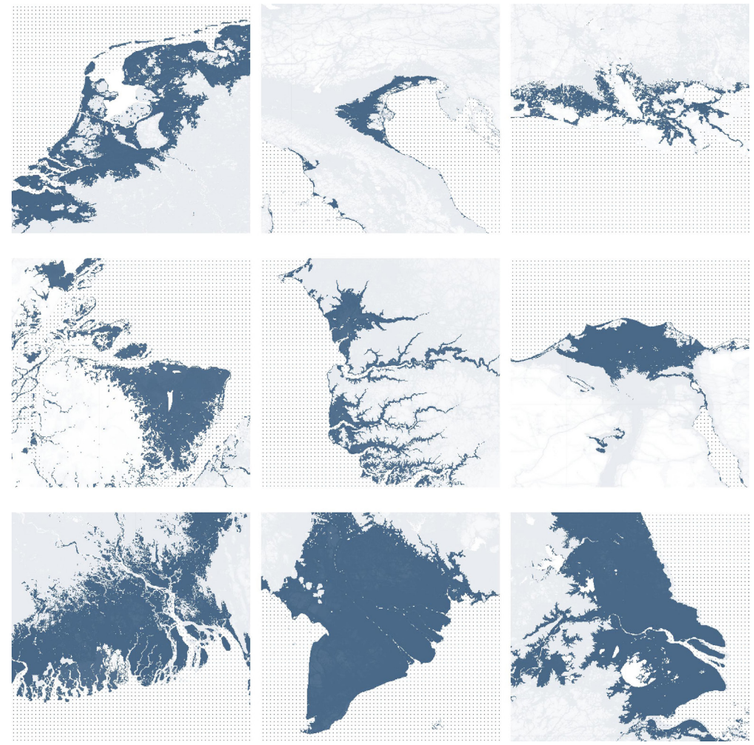


Figure 20. Areas under water given a significant melting of the Arctic.

Contribution to Profession

As urbanists, the land is often treated as the realm in which to operate. This work will expand on the traditional terrestrial urbanization theory and knowledge, and apply or alter it for marine conditions. While the work reflect Arctic conditions, offshore urbanization as a whole is still prevalent worldwide. Urban planning in low-lying island nations will soon have to follow the same premise, but in non-Arctic conditions. Therefore the design aspect and marine urban constellations will be a primary contribution for that target group.

Following that, the work would seek to contribute to the sub-field of bioregionally-informed planning. To how and where should bioregional territories be erected and managed when borders are in constant movement.

Lastly, it would seek to highlight the gaps in current legal understandings of the sea. Not only in terms of where to construct offshore infrastructure, but also to acknowledge non-human stakeholders during the planning process.

Scope

The project will delve to a larger extent on the territorial implication of Arctic offshore urbanization, rather than the specific livability on offshore structures. It is not to say that such criteria are totally ignored, but rather only selectively brought in if it directly inform matters on the territorial scale. Furthermore, the scope will primarily be on providing an overall logic and rationale to establishment of new and alterations or decommissionings to existing offshore structures. That include the specifics of offshore typologies in terms of foundation, size and program, but not the technical specificity on how to

1) achieve such transformations
2) secure sufficient architectural qualities of living on the platforms themselves

Given the multiscalar nature of urbanism, there will be overlaps into both the architectural and more-than-city realm. Regardless, as seen in the figure below, the overall weight of the scales do still reside on the mega-regional to regional level.

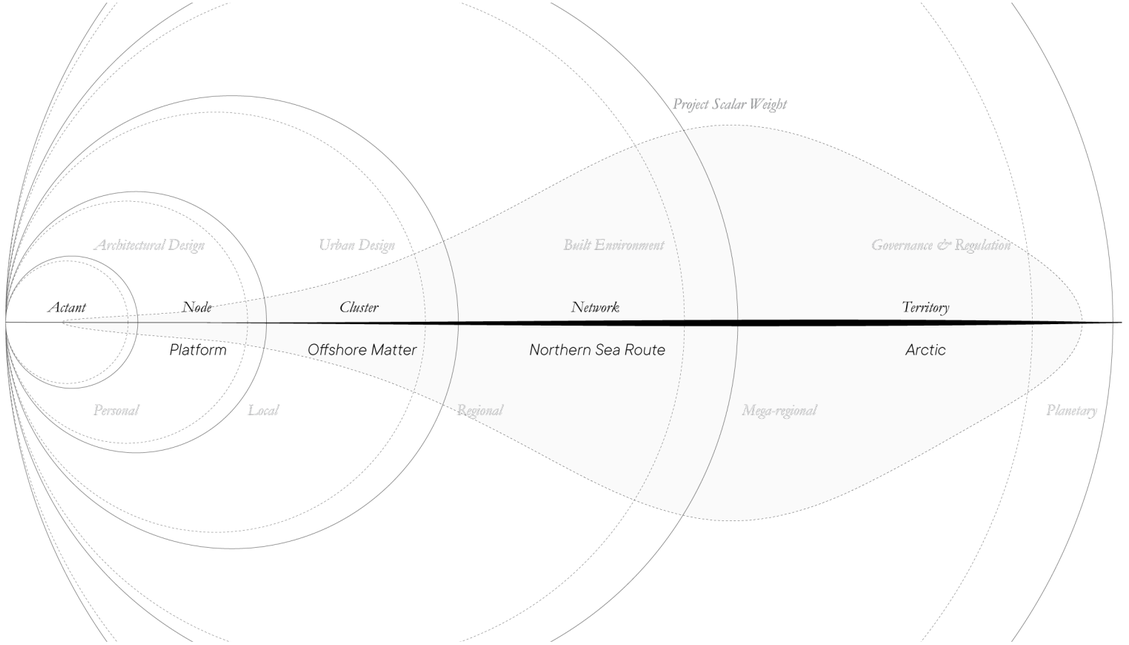


Figure 21. Weight of scales through the project, from a point of design. (Adapted from Vianello, 2026)

Methodology

Literature & Frameworks

theories
with
concepts
direction
methods

Earth can be grasped as a reasonable and coherent whole, by piling up scales one on top of another, from the most local to the most global – and vice versa – or thinking that one could be content with one's own little plot in which to cultivate a garden.

Bruno Latour,
Facing Gaia

Problem Statement

For centuries, the Arctic has been framed by external observers as a geographical frontier, an empty, frozen expanse interpreted as terra nullius and positioned as an obstacle to be traversed or conquered. This epistemic framing has had lasting consequences for how the region is understood and governed. Rather than being approached as a coherent and dynamic socio-ecological system, the Arctic has been fragmented through layered juridical, political, and scientific classifications that divide land and sea into discrete units of control.

This fragmentation produces three interrelated problems. Firstly, the Arctic as a marine-dominated territory remain without adequate political and legal recognition. This in part to the lacking circumpolar spatial knowledge systems and long-standing patterns of mobility which frequently are subordinated to external state centric governance frameworks.

Secondly, it operate as a border system without permanence. While environmental conditions such as ice cover and navigability are inherently dynamic and seasonal, legal regimes impose fixed maritime and territorial boundaries that struggle to reflect these fluctuations.

Thirdly, the Arctic function as a body without cohesion. Where interconnected atmospheric, oceanic, cryospheric, and human systems are managed through fragmented national and sectoral policies that fail to account for systemic interdependence.

As climate change accelerate environmental transformation and increase accessibility into the deeper arctic regions for marine traffic, these contradictions become more pronounced and pressing for the continued existence of the Arctic. The need to address and provide agency for the Arctic as a non-terrestrial, relational territory is of upmost urgency in light of recent developments along the Northern Sea Route.

Hypothesis

Regardless of any immediate intervention politically or spatially, the Arctic sea ice will melt substantially for the next decades. This will open up for passage in along the North-west Passage for the Northern Sea Route. How it will emerge or be managed is speculative, but the competitiveness of its Europe-Asia shortcut will nonetheless support its development. Without any measures, the shipping route will follow the same logic as any other in the past, by chasing a final optimum.

This theoretical path, known as the Transpolar Route or TPR, would pass almost directly over the geographical north pole. As so, one can expect a continuous push from the global economy to incrementally carve the itself closer to the TPR. Without interventions, spatially and politically, this would ultimately accelerate the already rampant destruction of the Arctic.

Research Question

Main

How can the Arctic, as a maritime territory, be given agency to mediate offshore and onshore activity along the Northern Sea Route?

Sub-Questions

	Analytical	Aspect	Deleuzoguattarian Field
A.1	What notions have led existing Arctic governance to fail at treating the ocean as an active agent in need of protection?	*Context*	*Expressive*
A.2	Which ways can agency of the Arctic Ocean be operationalized on a territorial/ circumpolar scale?	*Situation*	*Expressive*
A.3	What are the current urbanization processes within and around the Arctic?	*Form + Material*	*Expressive/Material*
A.4	What non-extractive intrinsic material value does the Arctic inhabit within and throughout seasons?	*Form + Purpose*	*Material*
A.5	What and where are the most significant biophysical, deterritorial forces?	*Context*	*Material*
	Design		
D.1	How can existing offshore platforms be operationally reprogrammed based on both biophysical and anthropogenic conditions?	*Material + Purpose*	*Material*
D.2	How can new offshore platforms be positioned and configured to mediate the Northern Sea Route with both human and non-human flow in mind?	*Situation + Form*	*Material*
D.3	How can offshore platforms challenge and improve the Westphalian governance model of the Arctic?	*Situation*	*Expressive*
D.4	How can offshore urbanization in the Arctic Ocean build on a new Arctic notion?	*Context*	*Expressive*

Theoretical Underpinnings

On Territorialization

Gilles Deleuze and Félix Guattari argue that territory itself is only a product of constant process of territorialization. The process where both material and immaterial, or rather the expressive, manifest itself into various components of what could be called a territory.

"A territory borrows from all the milieus; it bites into them, seizes them bodily (although it remains vulnerable to intrusions). It is built from aspects or portions of milieus. It itself has an exterior milieu, an interior milieu, an intermediary milieu, and an annexed milieu."

from 'A Thousand Plateaus' (1987)

For Deleuze and Guattari, territory is not a fixed container but an emergent condition produced through relations between bodies, materials, rhythms, and expressions. Territorialization is therefore an ongoing process of assembly and stabilization, while deterritorialization continuously disrupts and reconfigures these arrangements, generating new territorial forms and possibilities.

On Planetary Urbanization

Brenner & Schmid (2014) discuss the effects of globalization on the definitions and perceptions of urban and rural. It is reasoned that such concepts no longer can be viewed as separate or isolated entities, but rather a part of a greater global web of urbanization. This includes traditionally perceived hinterlands and the wilderness beyond, both discussed as spaces which have experienced significant shifts from its original meaning and state. They call for a revision on how to treat the operational landscapes of such planetary machinery, and strive towards a more-than-city approach to urban developments.

On More-than-human

Donna Haraway (2003) challenge the anthropocentric understandings of space by rejecting the separation between humans, nature, and technology. Instead, Haraway discuss how environments are produced through the idea of 'natureculture'. The continuous entanglement between human and non-human actors over time. Through concepts such as companion species and situated knowledge, Haraway emphasize that agency is distributed across multispecies and material assemblages, rather than solely in human actors. Landscapes traditionally framed as natural or wild are therefore not passive backdrops for human intervention, but active participants in the production of space. Haraway call for a change in perspective and a thorough application of more-than-human consideration and care.

On Assemblage Theory

Delanda (2016) reject the idea that a whole is defined solely by its parts, and that the parts are solely determined by its whole. Instead, Delanda argue that it is the interactions of elements, and sub-system of elements, that make a whole. Sub-systems can exist with various independency, and therefore can be 'assembled' with other sub-systems through its external relations. The relations are however not something that define the elements, meaning if it were to go from one system to another it would still keep its inherent identity.

Delanda further discussed that all assemblages operate within two dimensions; firstly that of territoriality and the process of the assemblage, and secondly that of element and the acts which elements do within the assemblage. For the first axis, ranging from territorialization to deterritorialization, one can include processes which stabilize or destabilize the assemblage. For the second axis, from material to expressive, its knowing if an element is acting materially or immaterially. With these concepts, Delanda provide a critical structural understanding of both matter and process across scales.

Political Ecology

Maria Kaika (2004) discuss that nature and politics cannot be separated, how one's definition of nature inherently becomes a political statement. The same separation is also translated between the built and unbuilt, where urban problems cannot be solved without understanding environmental problems and vice versa. Kaika point out that nature does not stop at the urban boundaries, as flows of nature keep the urban state afloat. A similar concept to that of urban metabolism (Wolman, 1965), but extended to a more-than-city perspective.

By viewing the built and unbuilt as one, Kaika see infrastructure not as a managing component of nature but rather a modern extension of it. It too, as with pipelines, carry flows just like rivers. However, Kaika argue that through cases like this nature have been depoliticized through invisibility. It is only during a break of flows that it regain politicization, which is also a signifier of how fragile human-induced control is.

Critical Zone

Bruno Latour (2020) reimagine the Earth as a thin layer of life between the lower atmosphere and canopies, to the groundwater and bedrock called 'The critical zone'. It is within this layer that most human and non-human activity take hold and interact. By projecting the Earth this way, Latour aim to politicize nature and give it a greater foreground role in politics. Like Kaika, Latour believe politics and nature are embedded in eachother and inseparable.

The Critical Zone emphasizes on flows and interactions between human and non-human, as well as the built and unbuilt. A key component in the projection is also the emphasis on interaction between sky, surface and soil, in addition to its highlighting of the soil as active and dynamic layer. It reframes the challenges of environmental issues to political struggles of material systems. Addressing said systems would therefore enable a path out of further environmental decay through both systems-thinking and political awareness of various human non-human interdependencies.

Theoretical Framework

In order to understand and give agency to the Arctic, the fundamental theoretical question one must answer is: how can agency be attributed to a water-based territory? Doing so requires understanding the Arctic not as a singular, coherent plane of existence but as a constantly mixing field of interactions between human and non-human actors, infrastructures, ice, currents, ecosystems, and political institutions. Acknowledging these assemblages, both material and immaterial, is critical. Because of this, and because the Arctic challenges conventional notions of fixed boundaries or Westphalian territory, the theoretical foundation of this thesis draws on the post-structuralist philosophy of Gilles Deleuze and Félix Guattari.

The sea embodies an anti-territory within the Westphalian system. It is fluid, dynamic, and difficult to divide either horizontally or vertically. Conventional territorial theories, grounded in notions of stable borders and bounded sovereignty, struggle to account for its nature. As Vianello (2026) argue:

"The Euclidean geometry that has defined the sea dematerializes its material dynamics and prevents the sea from being understood through its own ontology."

The sea, therefore, cannot be reduced to a flat surface upon which jurisdictions are projected; it must be understood as an active material process. This perspective aligns with assemblage theory, in which territory emerges from relations rather than from pre-existing boundaries. As Deleuze and Guattari (1987) argue:

"Within an assemblage, materiality persists and is re-formed amidst constant processes of arranging, gathering, mixture, and turbulence."

Water exemplifies this condition. Existing simultaneously as liquid, solid, and vapor, it continuously transforms while maintaining connections across scales and states. In the Arctic, sea ice, ocean currents, atmospheric systems, shipping routes, energy infrastructure, and ecological migrations form a relational assemblage that transcends conventional territorial divisions.

Consequently, the Arctic is approached not as a bounded object but as a process of continual territorialization and deterritorialization. Territory is produced through interactions among moving materials, legal frameworks, technological systems, and ecological rhythms rather than through fixed borders alone. Agency therefore resides not solely within states or human institutions, but within the capacity of these assemblages to influence, enable, constrain, and reorganize activity. By conceptualizing the Arctic as a maritime assemblage, the thesis seeks to establish a framework through which the region can be understood as an active territorial actor capable of mediating offshore and onshore development along the Northern Sea Route.

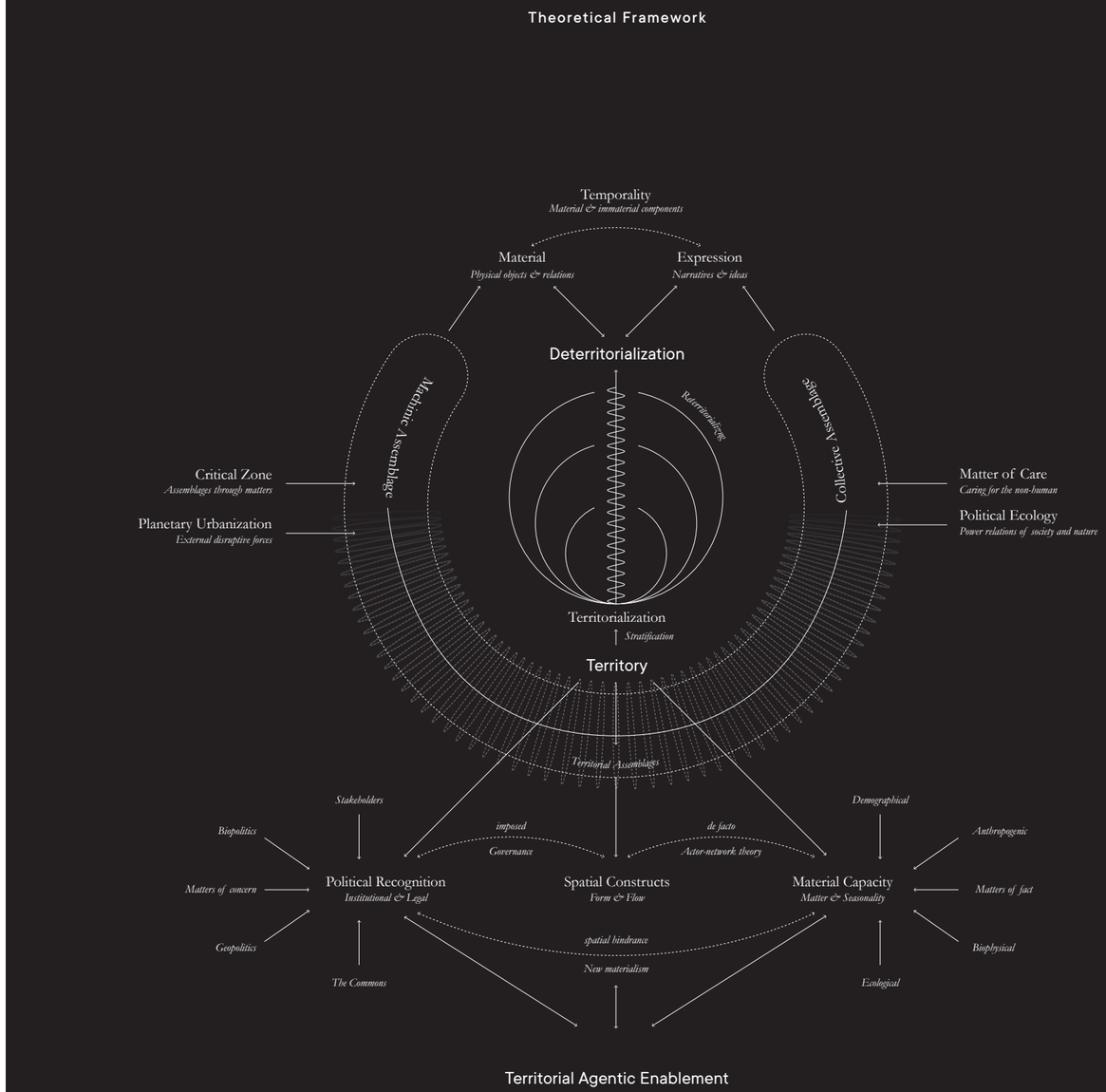


Figure 22. Theoretical framework based on Deleuze and Guattari's view of a territory with supplementary theories to (dis)-assemble the Arctic as a territory.

Conceptual Framework

The conceptual framework build upon the aspects highlighted in the theoretical framework with a more situated simplification. It synthesize the territorial aspects into three core parts:

1. the material, in the form of intrinsic material power
2. the expressive, in the form of political recognition
3. the spatial, the overlap of expressive and material, in the form of spatial configurations.

Each aspect have in return a specific angle to assess further for the analytical framework. A fault on either of the three corners lead to a specific state of agency, which can be utilized when assessing the Arctic more in depth. Each end node is listed as scale-less, but there is an inherent need on such a massive territorial scale to address for instance actors across scale.

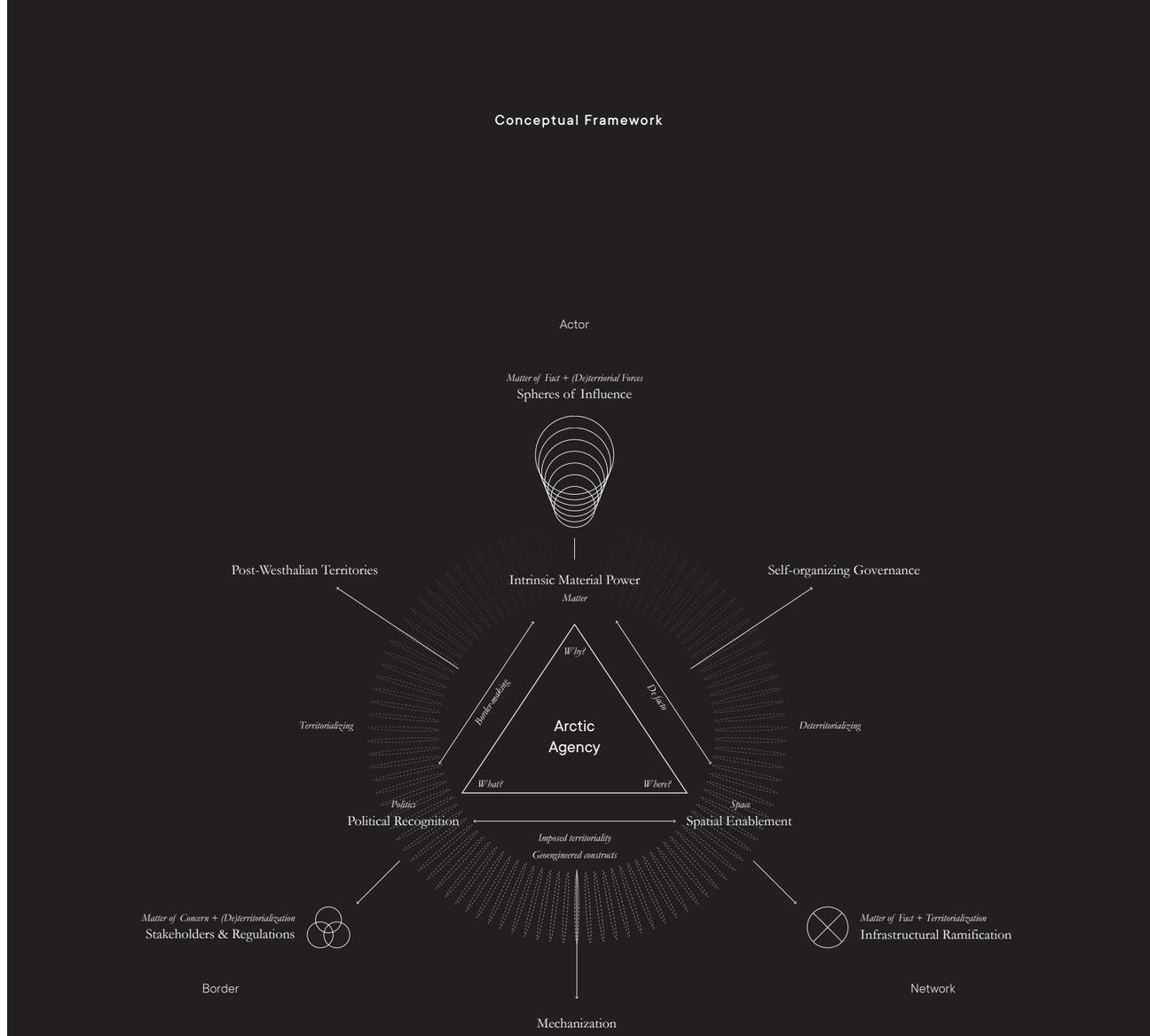


Figure 23. Conceptual framework highlighting the necessities to create a territory and the aspects to a

Constructing

Objective & Methods

Sub-Question

A.1 What main notions have, and continue to inform, the legal and economical divisions of the Arctic?

A.2 What are the current legal and governing issues in relation to the Arctic, and water-based territories?

A.3 What are the current urbanization processes within and around the Arctic?

A.4 What non-extractive intrinsic material value does the Arctic inhabit within and throughout seasons?

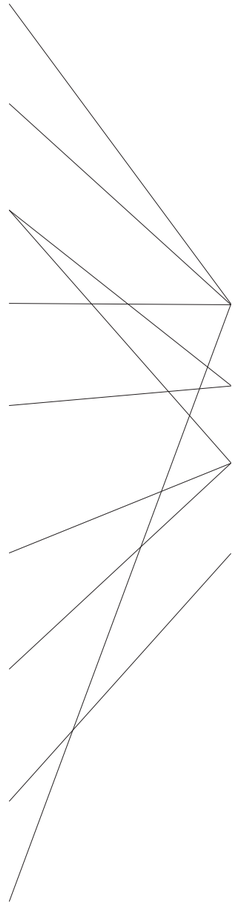
A.5 What and where are the most significant biophysical, deterritorial forces?

D.1 How can existing offshore platforms be operationally reprogrammed based on both biophysical and anthropogenic conditions?

D.2 How can new offshore platforms be positioned and configured to mediate the Northern Sea Route with both human and non-human flow in mind?

D.3 How can offshore platforms challenge and improve the Westphalian governance model of the Arctic?

D.4 How can offshore urbanization in the Arctic Ocean build on a new Arctic notion?



Objective

1. Articulate Arctic territoriality beyond a Westphalian logic

2. Locate biophysical and anthtopogenic reterritorial forces from the current Arctic state

3. Reavaluate offshore urbanization from temporal, extractive origins

4. Spatially enable a counter-force for the Arctic to respond to anthropogenic intrusion

Sub-Question

A.1

A.2

A.3

A.4

A.5

D.1

D.2

D.3

D.4

Method

1. Literature review

2. GIS mapping

3. Field work

4. Research by design

5. Policy Analysis

Analytical Framework

From the preliminary literature review and the aforementioned frameworks' call to assess both material and expressive properties, the analytical framework outline the matters to investigate in the analysis. While implicit in the diagram, the temporal dimension is throughout all selected territorial assemblages. In practical terms, this mean each element will be assessed in time when possible. Both climatic and socio-cultural aspects play a pivotal role on that for both the material and expressive branches respectively.

The framework also group the matter into four main typologies:

1. Material deterritorialization. Representing the biophysical decay of the current biophysical definition of the Arctic.

2. Legal territorialization. Representing the impacts of the Westphalian system and other imposed borders.

3. Political reterritorialization. Representing the shifting notions on the Arctic.

4. Epistemic reterritorialization. Representing state-of-the-art data-gathering and representation of data from the academic sphere.

Together, the aim is to have an analytical foundation of across the material-expressive assemblages of territory, as well as the various lines of flight that the territorial state is projected on.

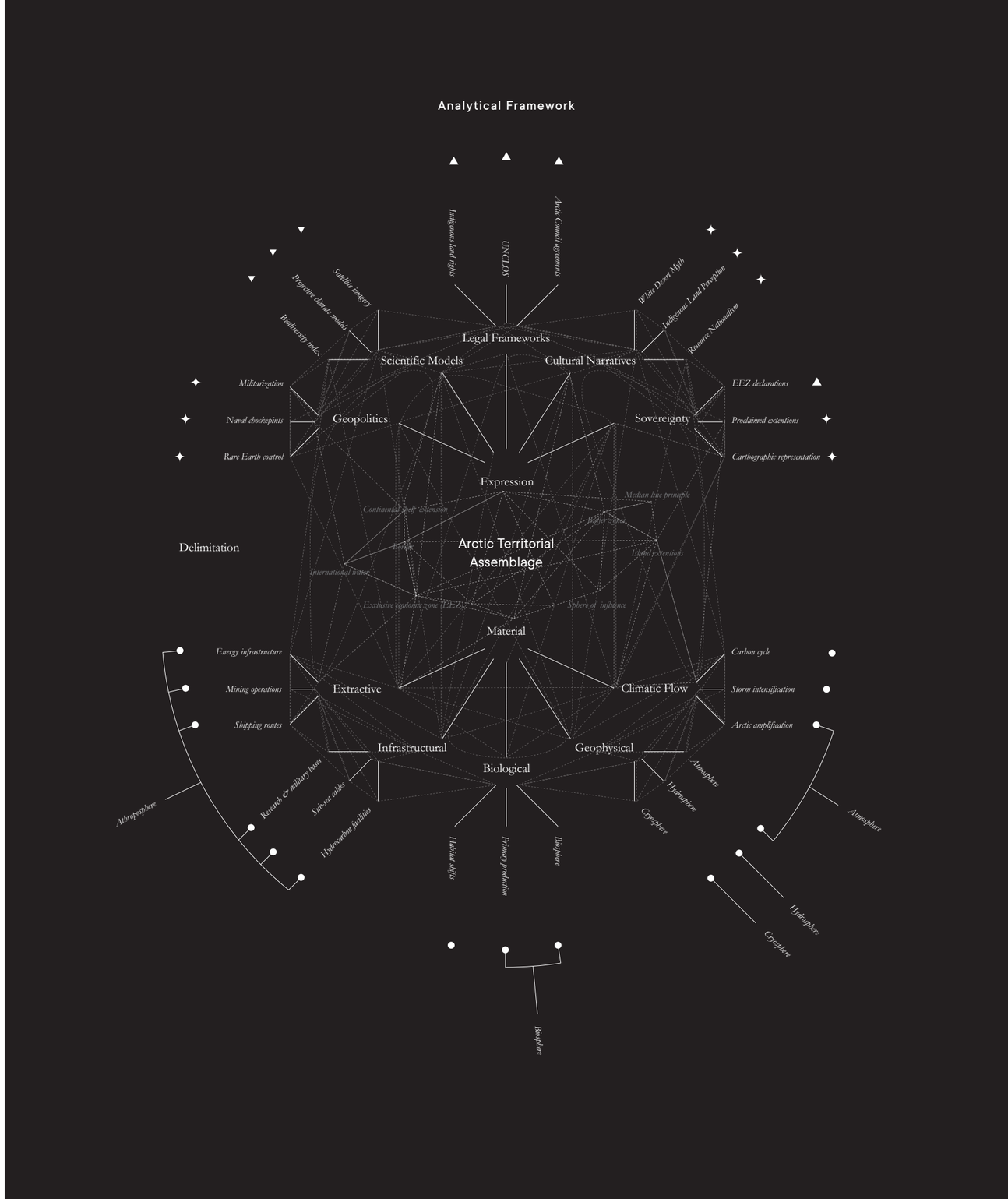


Figure 24. Analytical framework from the conceptual and theoretical framework. Shown in a semi tree-like structure to highlight elemental stratification, even if all elements are interchangable and interconnected as per deleuzoguattarian/rhizomatic logic.

Methodological Framework

The methodology stem from the theoretical framework, as well as a design-oriented approach, to tackle the broader issues related to arctic territoriality. A crucial early element was the external input on Arctic developments from different disciplines, marked as 'qualitative scoping' to the preliminary research in figure 25. Secondly was the fieldwork and early introduction to situated knowledge through field work, also marked 'qualitative scoping' in the following parts.

These early introducers made it possible in part to provide a frame of reference for some preliminary research questions, which were later redrafted. From here, first iterations of the problem statement were established with informing elements such as spatial (GIS) mapping and literature review. These three, qualitative scoping, spatial mapping and literature reviews formed a constant iterative cycle of the problem statement. This again created the foundation for the theoretical and conceptual framework, which again informed the methodological.

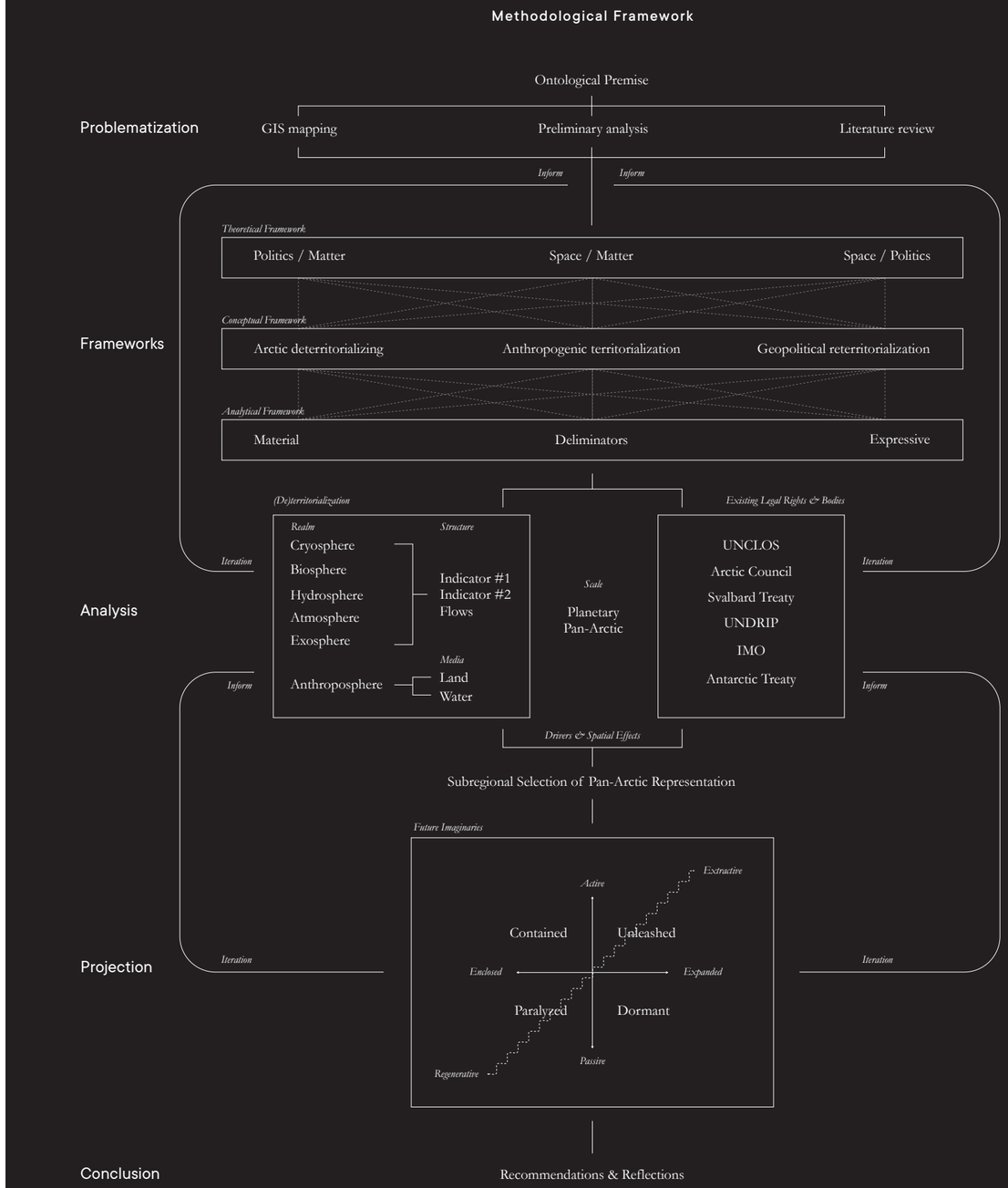


Figure 25. Theoretical framework based on the concepts surrounding destabilizing territories and their possible enablement of agency.

Applying

Rhizomatic Workflow

Urbanism overlap with both hard and soft sciences, and there are moments where the imposed structure and values of one side conflict with the other. For instance, a core value in positivism is objectivity, a value which can be toppled by the subjectivity within urbanism, like if something is numerically optimized but emotionally not. Space is therefore never neutral, nor always objective, or as Henri Lefebvre wrote in *The Production of Space* (1974):

"Space is not a scientific object removed from ideology or politics. It has always been political and strategic. There is an ideology of space. Because space, which seems homogeneous, which appears as a whole in its objectivity, in its pure form, such as we determine it, is a social product."

Thus it is, by Lefebvre's logic, paradoxical to approach a territory by pure objectivity. If one where to do so knowingly, it would again strike another pillar of rationalism, transparency.

This is an acknowledgement that while frameworks have been constructed and followed for the sake of replicability and documentation, it does not entail the subjective nature of urbanism and the inherent political and unknown sub-conscious beliefs which will be projected in the work. Applying deleuzoguattarian logic, or rhizomatic thinking, any hard-science setting would yield a conflict of interest due to its divergence of rationality's hierarchic nature, linear causality and elemental rigidness, or rather stasis of being. Still, in the field of urbanism this does not pose as such an issue. Rather, its way of handling complex systems, non-linearity and subjectivity give rhizomatic thinking its greatest strength for both urban and territorial matters alike.

Given how the aforementioned frameworks cater more to scientific positivism, *figure 26* expose the more convoluted reality of the project's emergence, development and end. Ongoing iterations, new inputs, forgotten older ones and shifting importance of the ones kept are all making the rhizome. Although positivism is abandoned in structure does not mean the rhizome, and thereby the project, is without empiricism and rationalism. It is simply transformed to informants of the whole, rather than the whole itself.

Some of the vital elements which ended up shaping the project are therefore included here. Not out of replicability, but out of transparency. Attending both the Arctic Futures Symposium 2025 and Artica art studio in Longyearbyen, Svalbard gave uniquely timed environments for external input which periodically greatly steered the direction of the thesis to where it ended up.

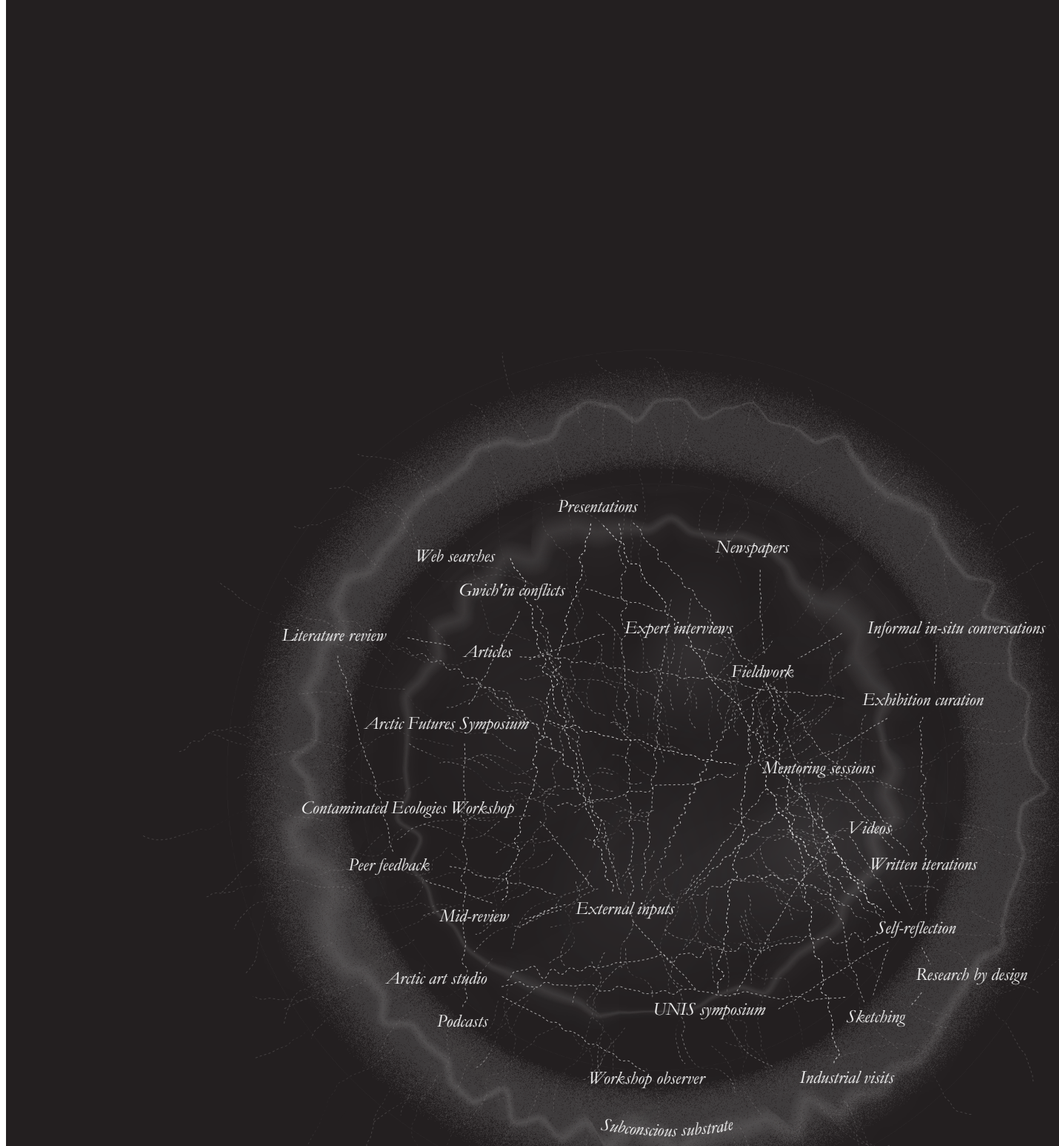
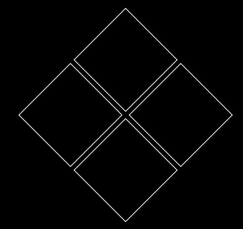


Figure 26. Deleuzoguattarian rhizomatic approach from the pre-established frameworks. Here highlighting the interconnected webs between not only methodologies but also events that unfolded (un)expectedly throughout the thesis progression. Surrounding the rhizome is a contextual cloud of consciousness, representing the importance of all previous knowledge accummulated into both the initiation of the work but also the inherent bias of contucting it.

Expressive

Notions of the Arctic Territorium

nationalism
imposed
extractivism
exposed
exceptionalism



What are your lines? What map are you in the process of making or rearranging? What abstract line will you draw, and at what price, for yourself and the others?'

Deleuze & Guattari,
A Thousand Plateus

The Narratives

As there is no true answer to what is and isn't Arctic, there will be various concurring notions imposed on the Arctic at all times. Each story is more true than others depending on the local conditions. For instance, standing on the vast Greenlandic ice sheet will give the impression of eternal white nothingness, while the oil wells of Alaska state the opposite. The Arctic is an amalgamation of what we as a society deem it to be, and it translates into both space and policy subconsciously and proactively.

The notion of the Arctic being a white barrenscape is in many ways fairly paradoxical, and wrongful in many more. For instance, if the Arctic is empty, as the European explorers of the 1600's would have you believe, then how can we also claim that it is vanishing? By addition is one way. However, when graphs of declinations are brought up, for example of ice sheet area, then there's suddenly a subtraction of nothing. Of course, this 'white myth' doesn't primarily stem from such historical observations, nor of deeper knowledge of the region's values. It is a superimposed view from southern cultures viewing the region from the outside. A sense of claiming this static land often followed suit.

However, Arctic was never empty to begin with and it wasn't a terra nullius, a no man's land, ready to be claimed. And while this early form of colonial mindset have faded slightly since the 1600-1900's, it very much embodies the modern misunderstanding and missing cultural knowledge of both the region and its inhabitants. As Edward Alexander, co-chair of the Gwich'in Council, expressed at the Arctic Futures Symposium 2025:

"Remoteness has allowed us to still exist largely in our own ecosystem, [...] however when people come to us and say that we are poor and suffering, I never knew that myself. We don't. We're just living differently."

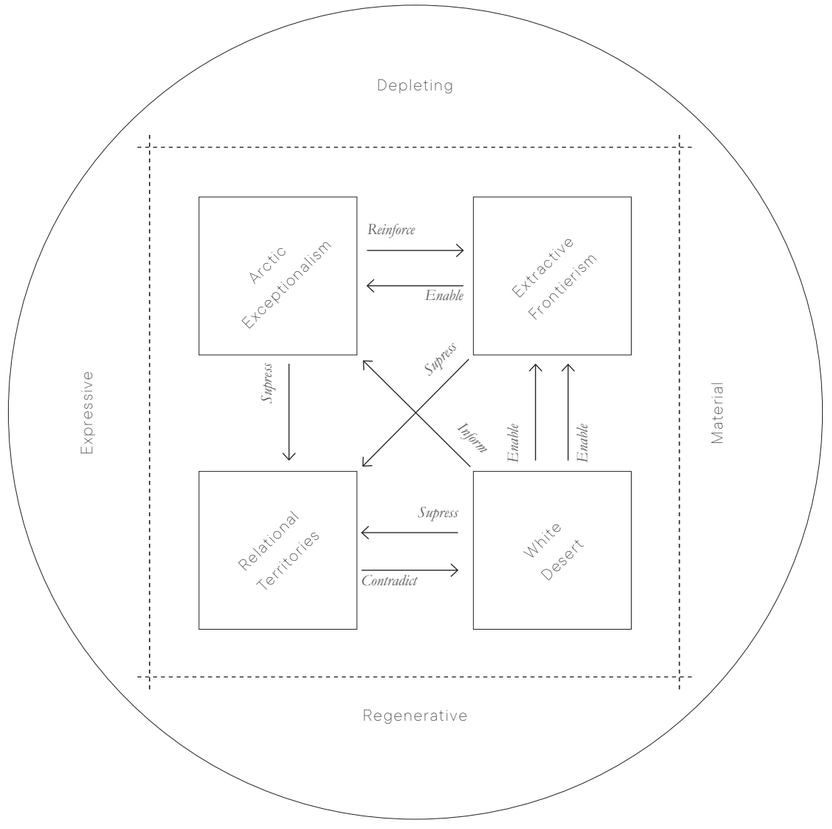


Figure 27. Overview of four main representative Arctic notions.

The Narratives

White Desert

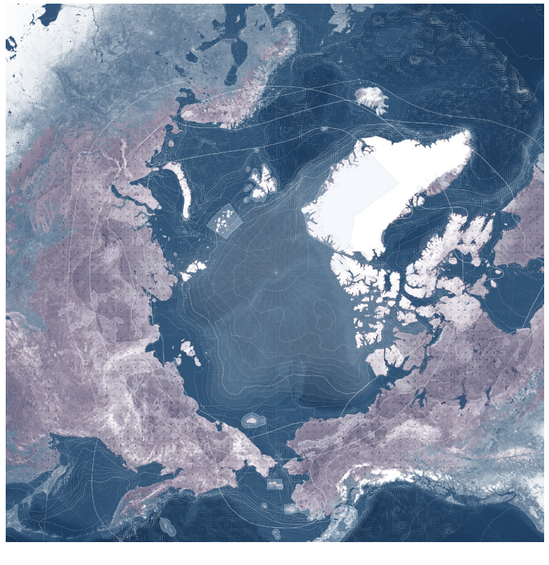


Figure 31. Mapping bias through the 'desolate bioregion' notion.

Notional Matter

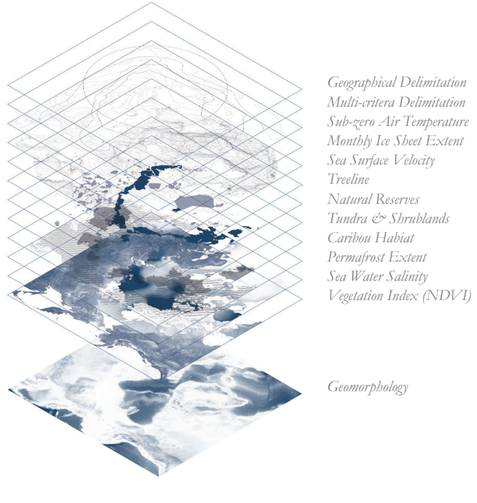


Figure 30. Notional matter of the desolate bioregion, or the 'Empty White Desert'

Extractive Frontierism

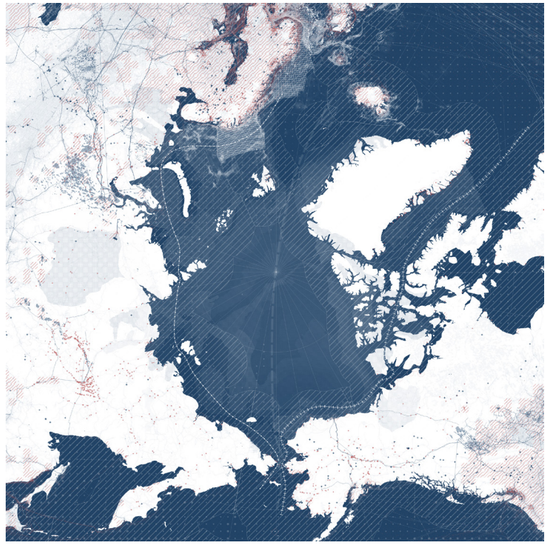


Figure 29. Mapping bias through the 'extractive frontierism' notion.

Notional Matter

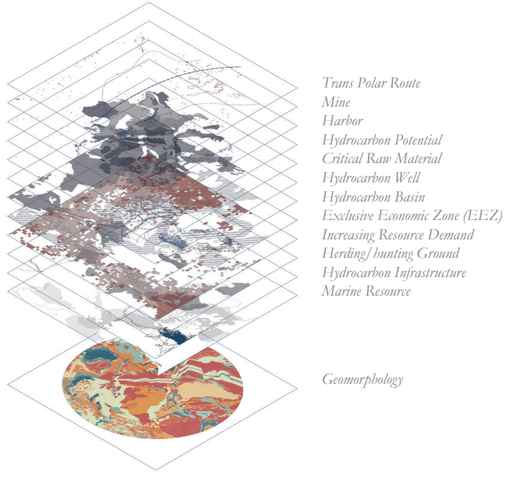


Figure 28. Notional matter of 'extractive frontierism'.

Arctic Exceptionalism

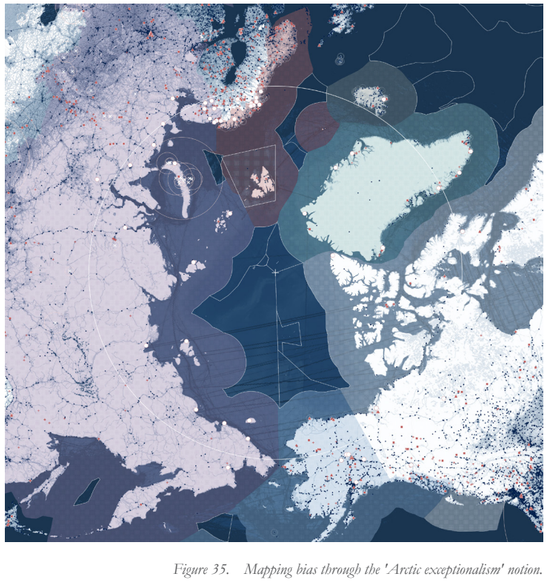


Figure 35. Mapping bias through the 'Arctic exceptionalism' notion.

Notional Matter

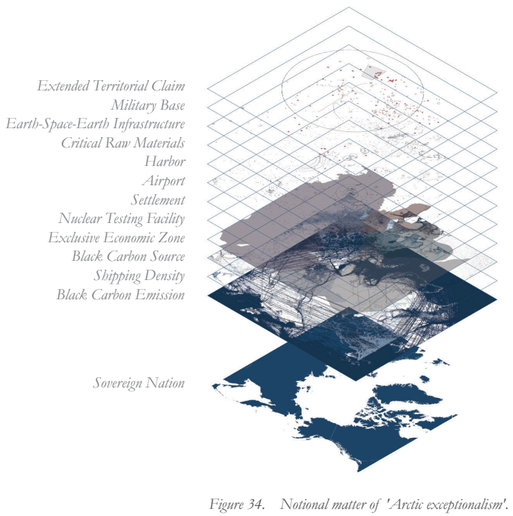


Figure 34. Notional matter of 'Arctic exceptionalism'.

Relational Homelands

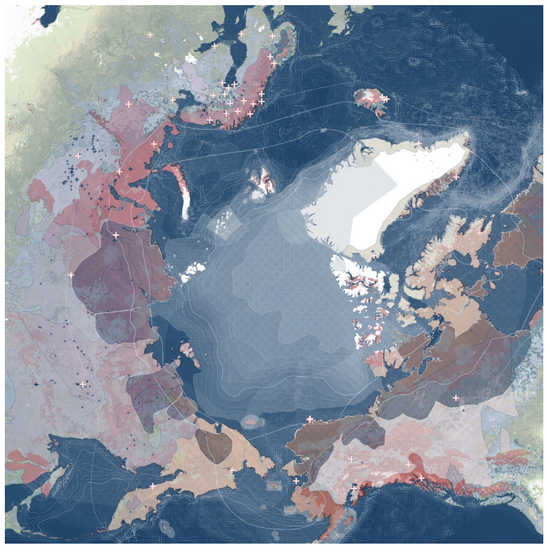


Figure 33. Mapping bias through the 'relational homelands' notion.

Notional Matter

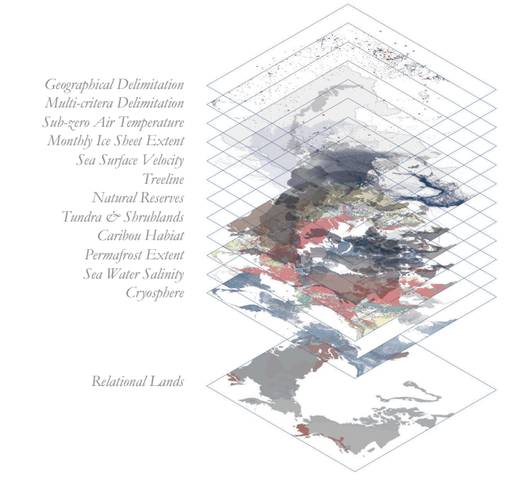


Figure 32. Notional matter of 'relational homelands'.

Concurrent Notions

Historical & Spatial Logic

The four notions represent distinct historical and spatial logics through which the Arctic has been understood and governed. The 'White Desert'-notion emerged from early European exploration narratives of the seventeenth and eighteenth centuries, portraying the Arctic as an empty biophysical surface devoid of meaningful human or ecological agency. This perceived barrenness led to the 'Extractive Frontierism'-notion to gain foothold during the industrial and explorative age. What followed was decades of developments and abandonments of extractive industries.

After WW2, 'Arctic Exceptionalism' emerged as Arctic states sought to stabilize and govern the region through international cooperation and legal frameworks. Its spatial logic is rooted in fixed territorial sovereignty, maritime jurisdiction, and bounded national interests. The definite Westphalian notion. Throughout all of these external notions, the indigenous communities in what can be described as having an directly opposing nation of relational territoriality.

Today, all of these notions influence the Arctic concurrently, shaping not only contemporary Arctic development, but also governance, and environmental alterations. However, the flaws are emerging from these Westphalian notions on as more light are being shed on indigenous communities and the internal notions of the Arctic an interwoven landscape assemblage instead.

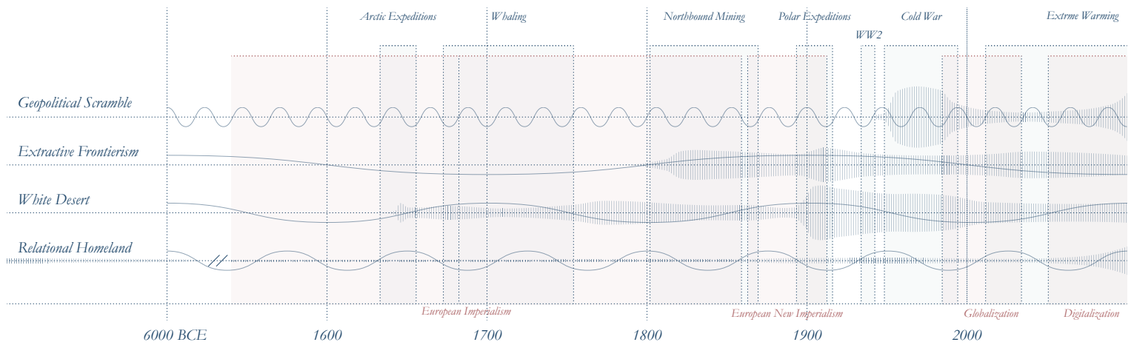


Figure 36. Timeline of each notion, the historical events that formed them and the relative significance over time.

Table 1: Overview of causes, consequences, flaws and role each narrative has towards hindering or enabling Arctic agency.

	White Desert	Extractive Frontierism	Arctic Exceptionalism	Relational Homeland
Position on Non-Terrestrial Territoriality	Low degree of compatibility, depsite a bioregionally-based angle	Supportive of marine territorialization if it enable control of passage/ extraction	Supportive of marine territorialization based on nation state logic	Strongly supportive of marine-based territoriality beyond statehood
Position on the Arctic Ocean as Subject	Denies Arctic agency, through passification	Instrumentalizes Arctic agency, through exploitation	Mediates Arctic agency, through stewardship	Embodies Arctic agency, through relationality
Notional Angle	Biophysical surface condition	Geological subsurface condition	Juridical land ownership	Historical socio-ecological relations
Timescale (Longue Dureé)	Long (Biophysical rhythm)	Extremely long (Geological rhythm)	Short (Political rhythm)	Medium (Relational rhythm)
Main Actant	Environment (as backdrop)	Captial and technology	Nation states	Human-nonhuman assemblages
Spatial Logic	The surface is empty and uniform	The subsurface is a resource reservoir	The terrestrial and marine are divisible, rigid parcels	Territories are seasonal and network-based
Historical Emergence	Well-established after initial explorations in the 1600-1700's	Took off in the 1800's, falling off briefly in the early 1900's Cold War with modern resurgence	Strong global foothold from post-WW2 and throughout the late 1900's Cold War period as a place of 'peace'	Multi-millennia old, but regionally confined up to the globalized age
Legal/Institutional Standpoint	Terra nullius	Terra nullius rooted claiming through block leasing	Fixed national borders with rights to marine resources through the EEZ	Co-management of land with local chairships
Resulting Spatial Consequence	Superimposed borders and overly abstracted zoning	Offshore and high-north extractivism, particularly of hydrocarbons	Militarization along territorial extensions, eg. islands and expanded EEZ claims and international cooperation	Co-managed land within special zones within and across nations
Primary Enabled Stakeholder	Interlopers and scientific/ international institutions	Energy, infrastructure & mineral companies and coastal nations	Nation states, defense- & military institutions and offshore industries	Indigenous communities, terrestrial and marine non-human actors
Primary Marginalized Stakeholder	Indigenous inhabitants and non-humans	Indigenous inhabitants and non-humans (especially marine actors)	Migratory non-humans (especially terrestrial actors) and transboundary ecosystems	Centralized nation state authority, large-scale extractive industries and interlopers
Degree of Agenic Enablement	Complete disabling. The land is passified externally and any observed dynamism contradicts the notion and is ignored	Complete disabling. Ice and arctic conditions are viewed as a hindrance for the area to become active	Equally enabling and disabling. The Arctic is a passive agent, but is nationally given room for recognition	Partial enablement. The land takes an active role in life, but often without institutional recognition
Fundamental Flaws	Romanticizes the static concept of the Arctic while disregarding nearly all human and non-human activity	Heavy promotion of technosolutionism to a constructed and occationally non-existent problems	Strict, hard-bordered parcelization of terrestrial and marine territories prohibit the recognition of natural processes	Lacking macro-scaled institutionalization, largely leading to subjugations of greater powers like nation states or even large companies
Key Learnings	Recognition of dynamism on, above and underneath the surface	Assert ice not as a hindrance, but as having direct material control	Adaptive and transboundary legal support systems	Macro-scaled institutionalisation of relational knowledge

Stakeholders

Notions of Power

The current state of the Arctic have a strong positions on nation states and any pre-established or emerging industries. While indigenous groups and local inhabitants over the last decades have gotten greater political representation, often it is still overthrown by the interest of the nation or private industrial sector. Since these relatively less influential groups often also represent the non-human interest, the latter's power diminish further. Certain NGOs, such as WWF, do solely take the position of the non-human. The challenge that still linger is the inevitable conflict with the high-power private or nationalized industrial sector.

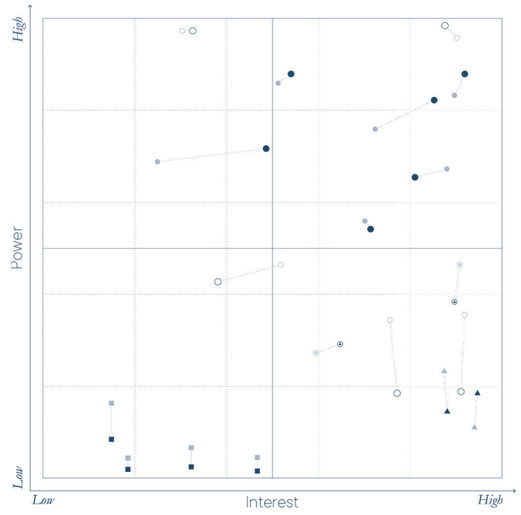
Regionally or even locally, each notion carry a greater or lesser influence. Such as the difference between northern Alaskan oil field sites and its Gwitch'in indigenous territory. As seen in the figures on the right, most notions push on the private industrial or national actors to determine the region's developments. The concurrent culmination of this is naturally the Arctic Council. While led by state-centric notions, the council also attempt to bridge the significantly different positions between nation states and indigenous communities. However, the acknowledgement of non-human actors going across borders are still largely disempowered.

Circumpolar Arctic Stakeholder Dynamic

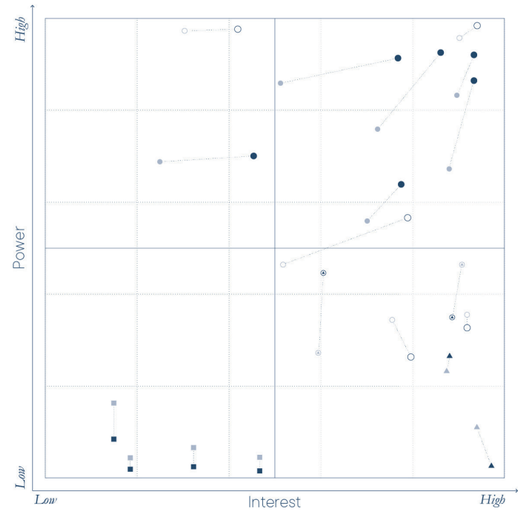


Figure 37. Stakeholder analysis of the current state of the Arctic.

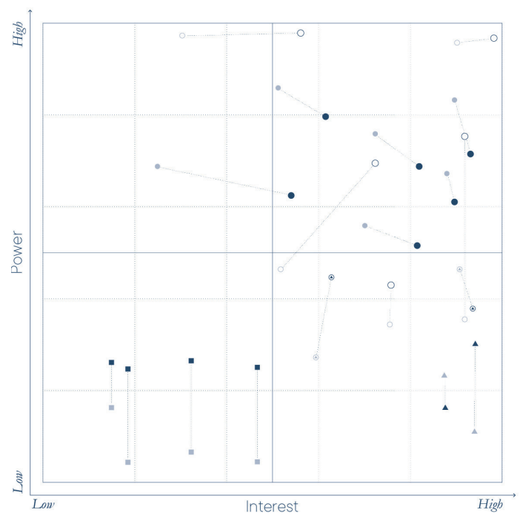
White Desert



Extractive Frontierism



Geopolitical Scramble



Relational Homelands

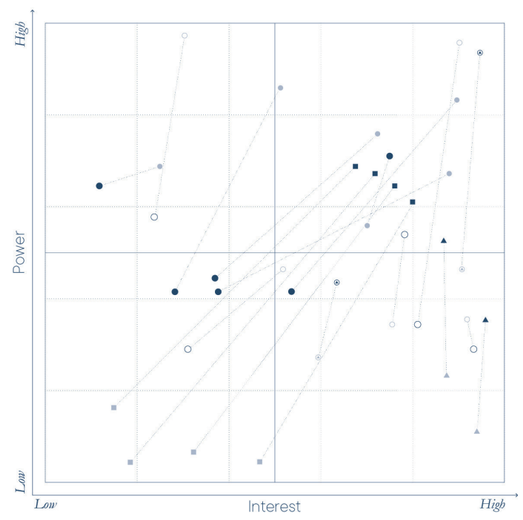


Figure 38. Stakeholder shifts between each narrative to the overall circumpolar dynamic. Most show a general pull towards the upper quadrant for the private sector, which also largely aligns with the real situation. However, following those notions to a greater extent would also lead to further collapse and paralyzation of the Arctic as an actant.

Towards More-than-Westphalian Goverance

A Field of Agency

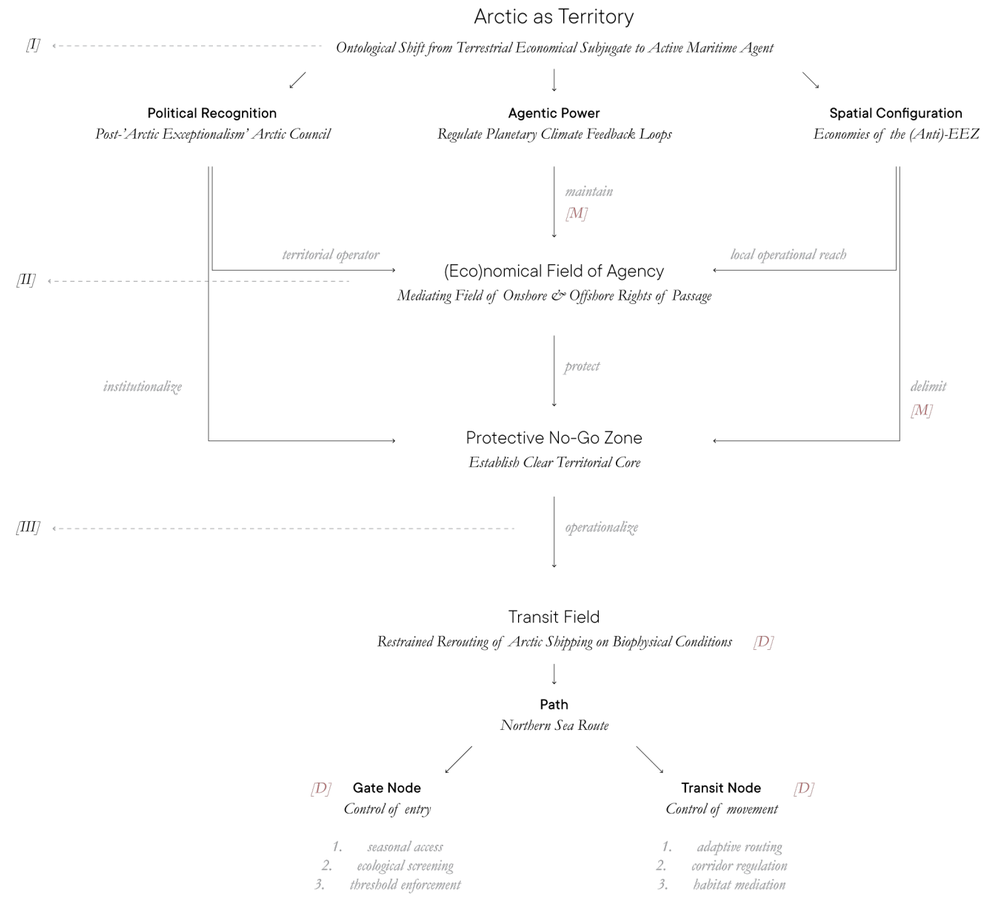
Current Arctic governance models, through the Arctic Council, have been tested within and beyond what it was design around. While it has seen historical success in circumpolar cooperation, it will not be able to handle the projected marine future if it cannot change. The shift needed would me at the council's very core, but it is needed on the governance logic to better operate the Arctic.

The position the new Arctic Council for an imagined agentic field must be able to transfer power away from its own members and to the Arctic itself. Rather, instead of nation states governing the Arctic territory as fragmented pieces of economic as ecological values, the Arctic territory must govern the nation states' economic activity in return. Both on offshore and to some degree onshore. An imagined EEZ from the Arctics own marine-based dominance, where the sea can subjugate the land.

[I] An ontological shift from the dominant concurrent notions, to a holistic more-than-nation

[II] A reframed Arctic Council with greater acting power on interpreting, representing and protecting (non)-human Arctic territoriality

[III] An industrial power shift, by having the greater environment dictate appropriate industrial activities



Notional Shift [I]
Governance Reframing [II]
Spatial Alteration [III]

Material Analysis [M]
Design Element [D]

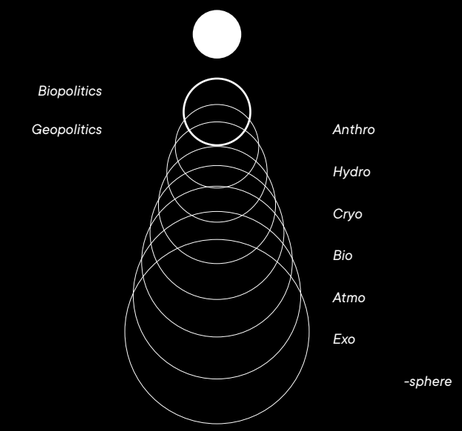
Material

Spatio-temporal analysis of imposing forces

anthropogenic
advance
planetary
recede
biophysical

Our current condition merely relies on our more explicit understanding that this tentative technological system, this "life support," entails the whole planet—even its atmosphere

Bruno Latour,
Reassembling the Social: An Introduction to Actor-Network-Theory (2005)



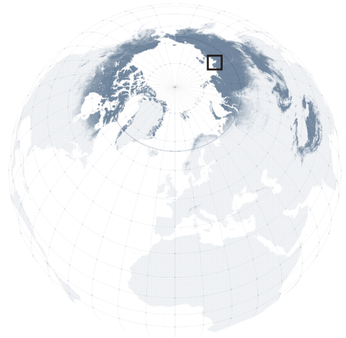


Figure 39. Location of cryospheric illustration site

Bindings of Air, Land & Sea

Material Power

The cryosphere is the embodiment of the material Arctic in many ways. It is a critical landscape where the relationship between land, sea, and air continuously shape it to the extreme. Along the seasonally thawing marine and terrestrial cryospheric edge, permafrost thawing release previously trapped organic matter, nutrients, and heavy metals into Arctic rivers (Cordier et al., 2025). Solid matter, which then is carried into the ocean, and gaseous matter by air. In this way, the land directly alters marine ecosystems, ocean chemistry, and coastal productivity. At the same time, warming oceans and declining sea ice intensify atmospheric heat exchange, accelerating further thaw across terrestrial environments (Xiao, 2015).

These interconnected processes are deeply tied to the Arctic carbon loop. Permafrost soils store nearly twice as much carbon as is currently found in the atmosphere, and when thawed, part of this stored carbon is released as carbon dioxide and methane, amplifying global warming. The atmosphere therefore becomes both a receiver and driver of cryospheric transformation.

Understanding these exchanges is essential for any material analysis of the Arctic because territoriality in the region is no longer only defined by borders or extractable resources. The cryosphere itself acts as a form of planetary infrastructure: regulating climate, storing carbon, transporting nutrients, and mediating global energy balance through sea ice reflectivity and ocean circulation. Questions of sovereignty are therefore increasingly entangled with questions of ecological stewardship, climate governance, and the material agency of Earth systems.

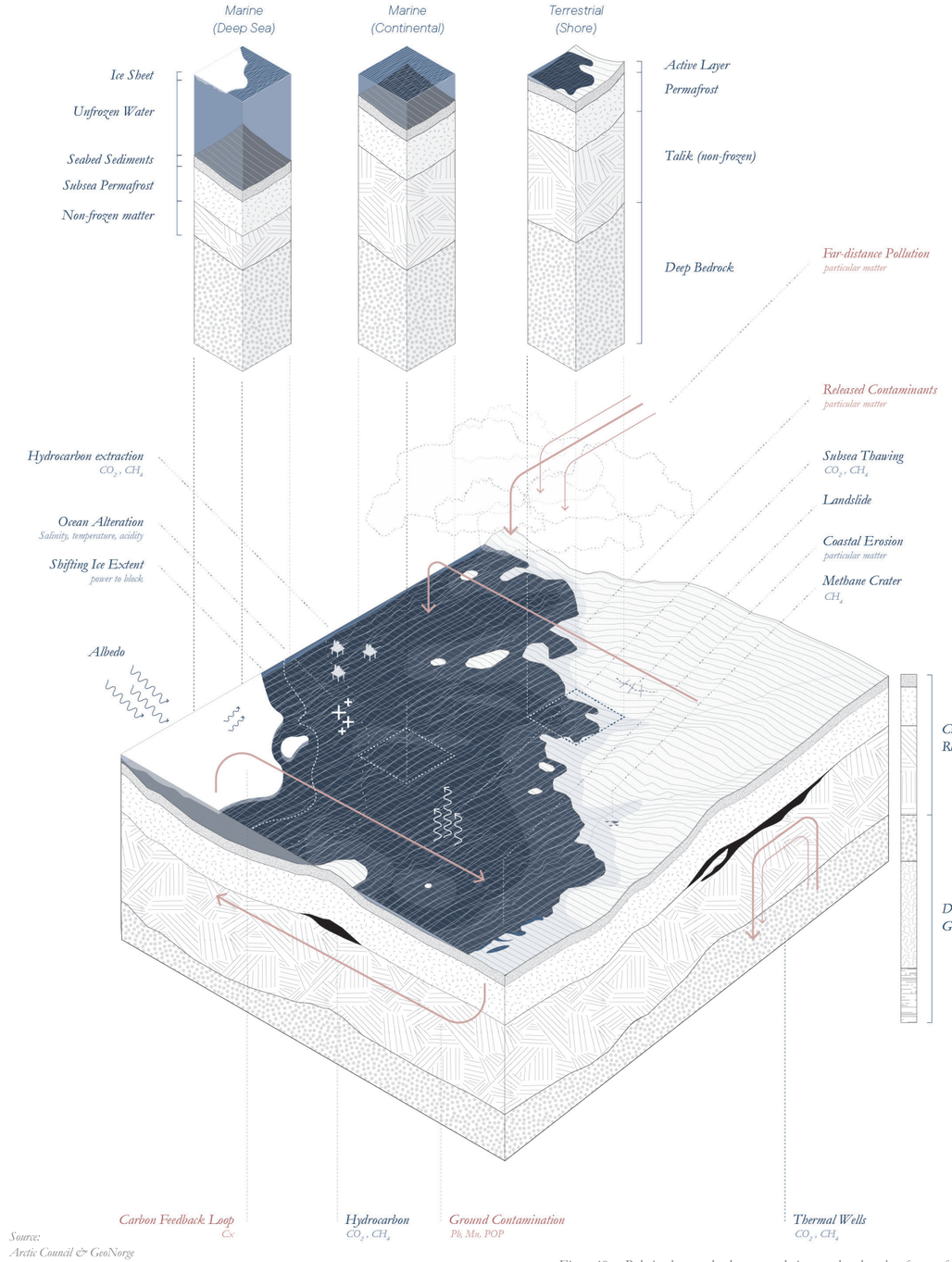


Figure 40. Relation between land, water and air, or rather the subsurface, surface and supersurface.

Planetary Assemblage

Reterritorial Forces

When stating that the Arctic is changing, it is often referring to a change in air temperature or ice sheet extents. Looking at a singular, isolated condition will ignore the interrelationality and greater implications across matter. Naturally, an increase in air temperature will likely lead to higher sea surface temperatures, but it also goes the other way. If the sea is warming, then shorelines containing wither marine or terrestrial permafrost will thaw and erode at a greater rate. Similarly, for the ice sheet, one can observe melting from below as above. A single input from either anthropogenic or biophysical origins therefore responds to the whole Arctic assemblage.

There's still a distinction to be made between the two forces:

Firstly, the biophysical. It being constantly shifted way from its predefined state and from there be seen as shrinking, or deterritorializing. Secondly, the anthropogenic. Urbanization of land, sea and air is a evident, and at each level there's an imposing territorializing force headed north.

The point of reference for any reterritorial force is critical, as either territorialization or deterritorialization it simply against a baseline. And in the arctic context, that is rapidly shifting.

The following pages will include maps showing various (de)territorial processes across water, both in liquid and solid form, land and air. It is done over a 30-year average as to better resonate with the longer environmental rhythms against the shorter and more extreme annual differences of summer and winter. Through the focal matters, the temporal maps will serve as an indicator for where and to what extent the biophysical baselines will shift in the future.

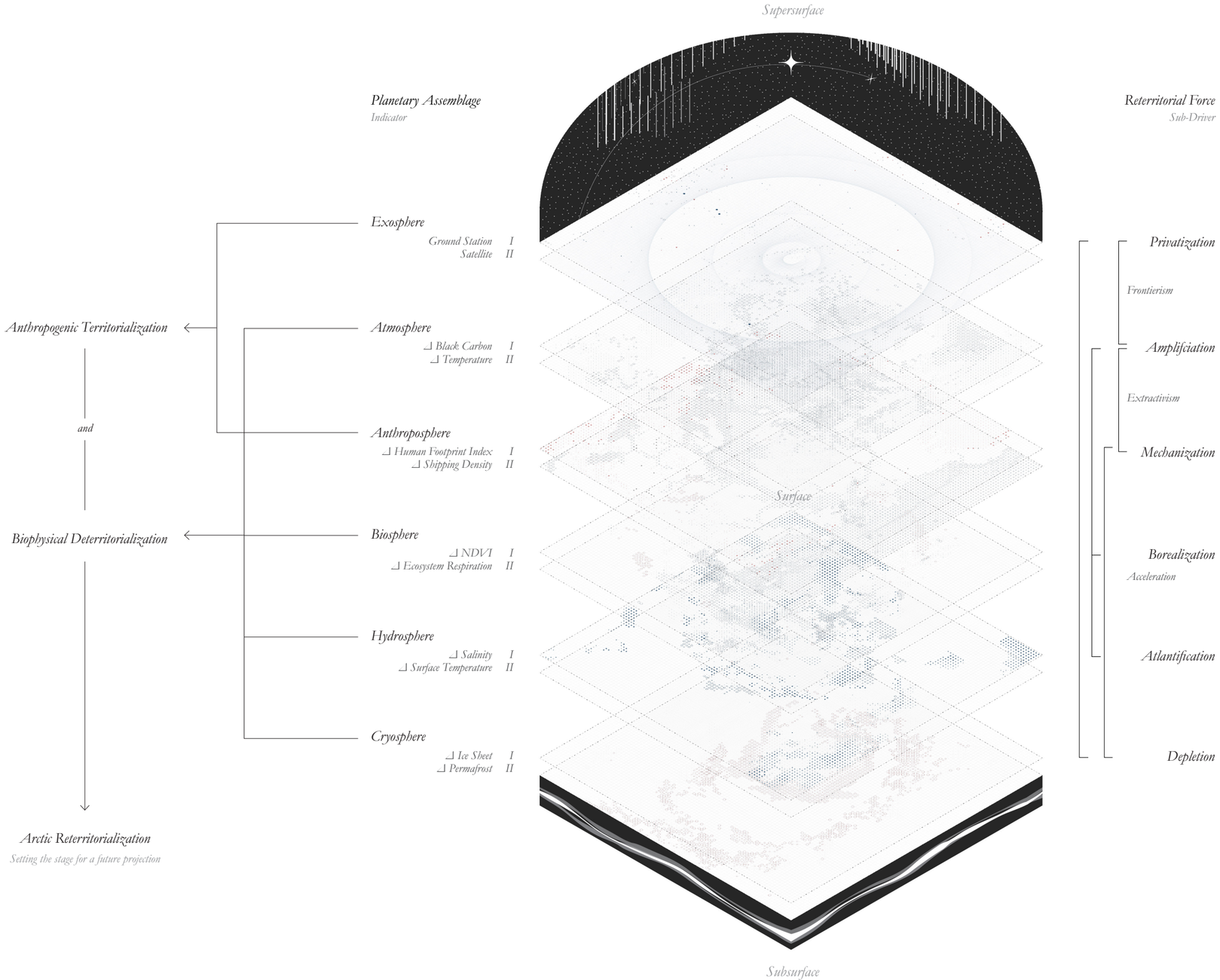
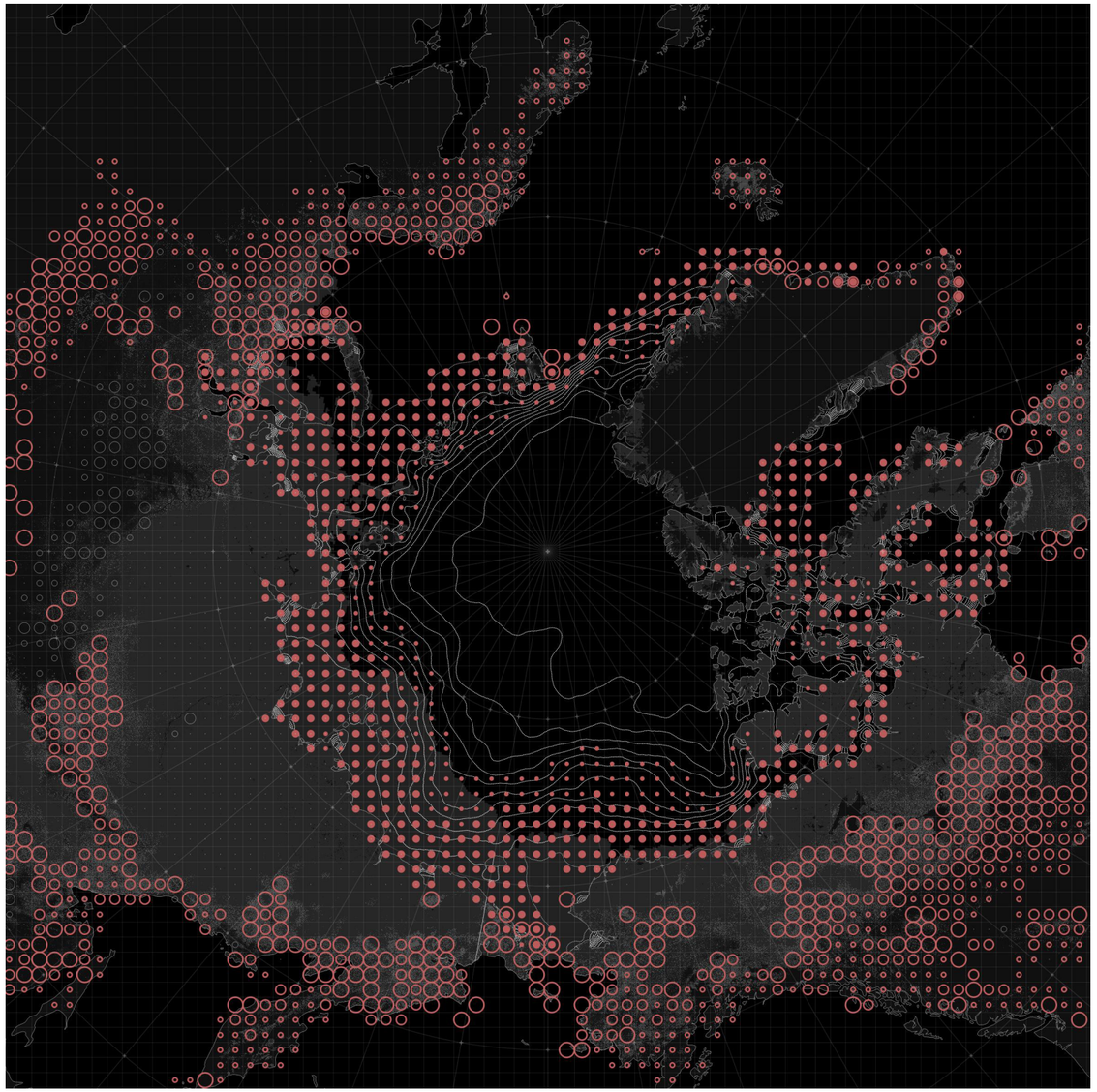


Figure 41. Analytical synthesis of the selected planetary assemblages and its main indicators correlating to a (de)territorial force.

Cryosphere

⌟ Permafrost & Sea Ice Coverage (1990-2020)



+⌟ Permafrost Coverage, %
- *<5.0*
- *5.0-10.0*
- *10.0-20.0*

-⌟ Ice Sheet Coverage, %
- *>25.0*
- *25.0-50.0*
- *>50.0*

-⌟ Permafrost Coverage, %
- *<5.0*
- *5.0-20.0*
- *20.0-80.0*

EPSG:3575
1 : 36 000 000

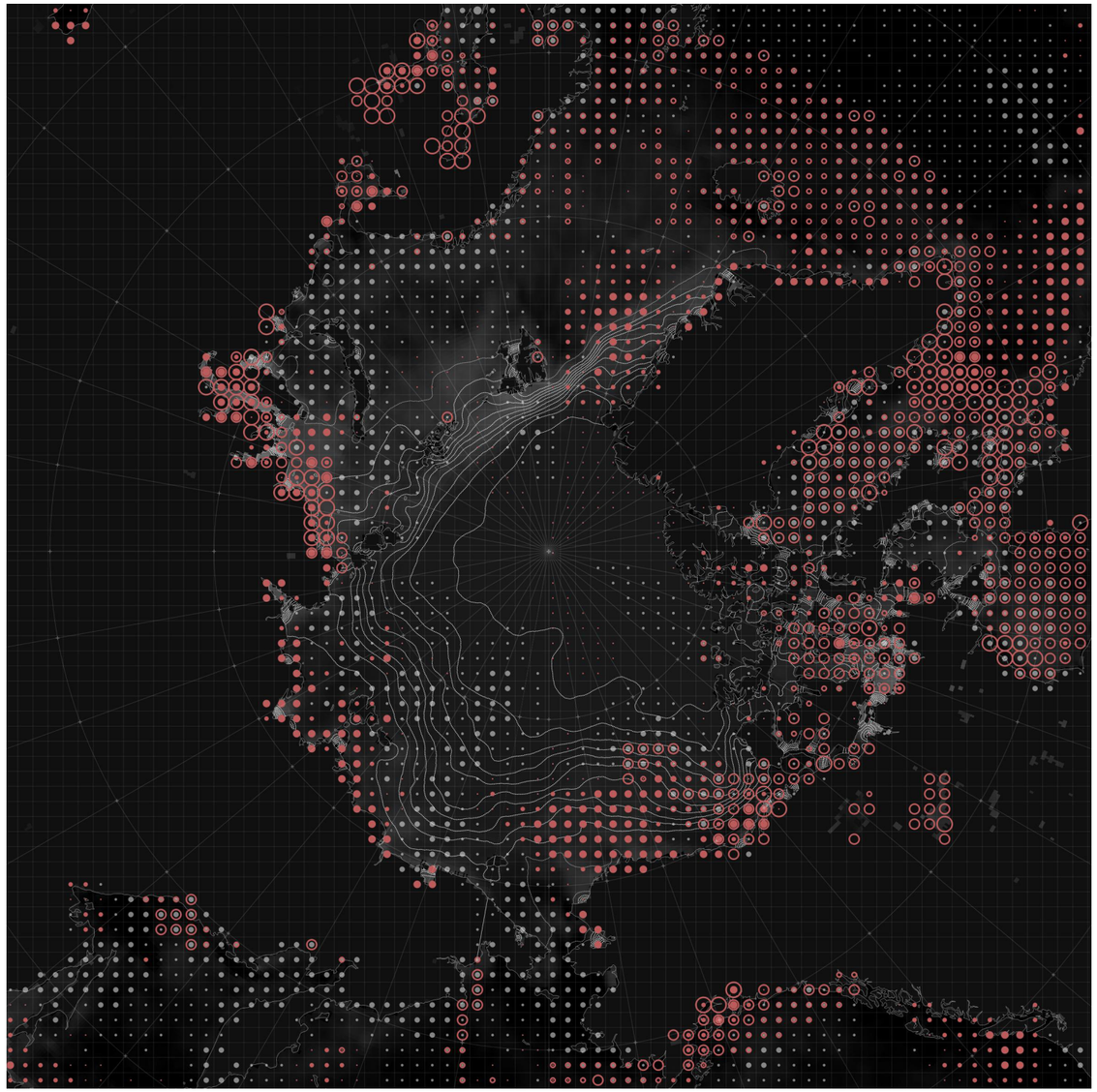
100 x 100km

Source:
Permafrost CCI (2025)
GeoNorge (2025)

Figure 42. Change in the cryosphere over a 30-year period. Deterritorialization is not happening within the same areas, rather within two distinct bands. One of land, the other of sea. An emerging split of the 'typical' Arctic has arrived.

Hydrosphere

⌟ Sea Surface Temperature & Salinity (1990-2020)



EPSG:3575
1 : 36 000 000

100 x 100km

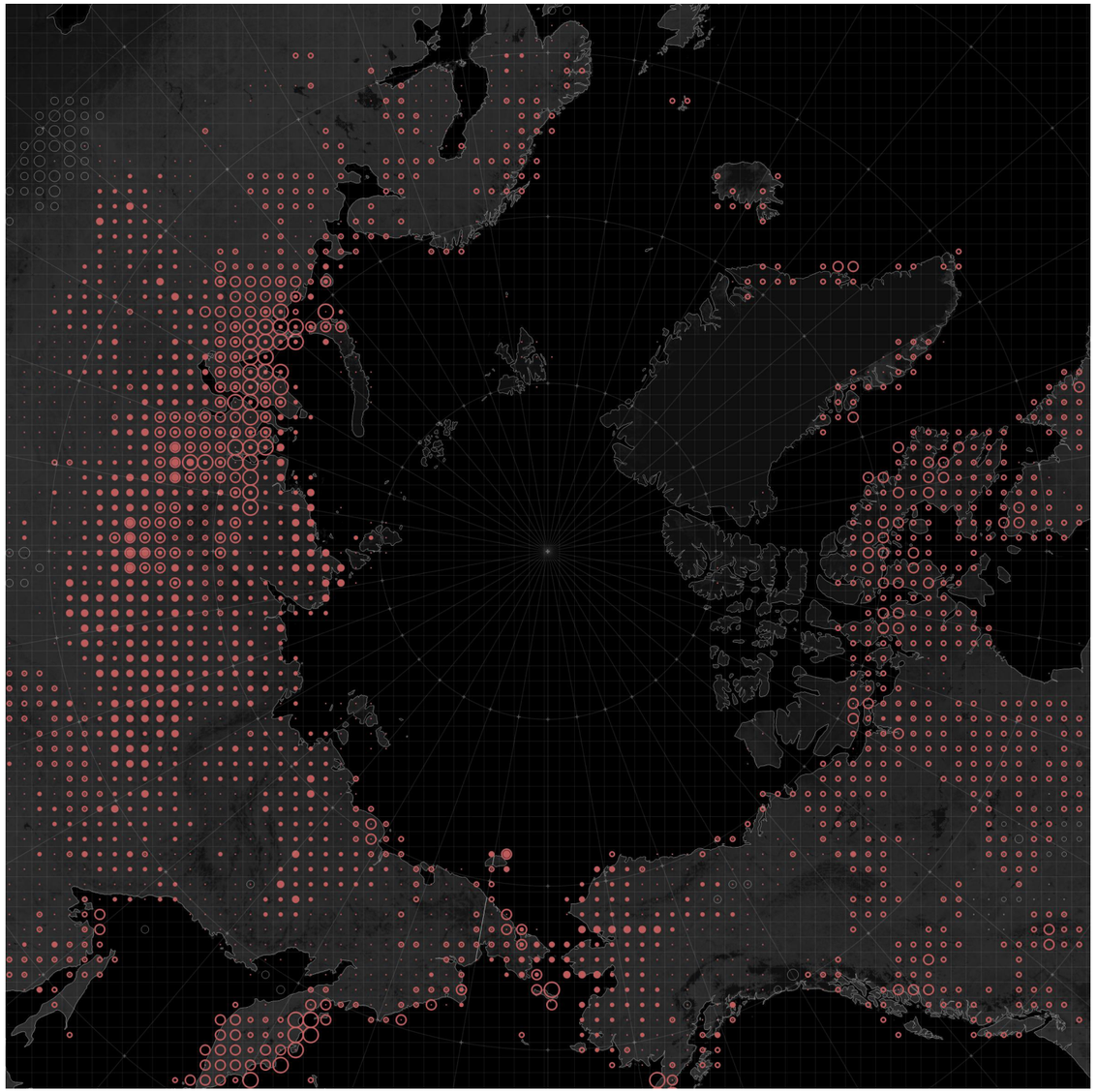
Source:
C3S (2026)

-⌟ Sea Surface Temperature, °C 1990-2020	*-⌟ Salinity, mg/l 1990-2020*	*+⌟ Sea Surface Temperature, °C 1990-2020*	*+⌟ Salinity, mg/l 1990-2020*
<2.0	*<0.25*	*<1.0*	*<0.25*
2.0-5.0	*0.25-1.0*	*1.0-5.0*	*0.25-1.0*
>5.0	*>1.0*	*>5.0*	*>1.0*

Figure 43. Change in the hydrosphere over a 30-year period. Shallow waters along the continental shelf are experiencing Atlantification at relatively greater degree. Deeper waters are more susceptible to change in salinity, depending on water flow.

Biosphere

⊿ NDVI & Ecosystem Respiration (1990-2020)



-⊿ NDVI, 0-1
- *<0.1*
- *0.1-0.3*
- *>0.3*

-⊿ Ecosystem Respiration, %
- *<5.0*
- *10.0-20.0*
- *>20.0*

+⊿ NDVI, 0-1
- *<0.1*
- *0.1-0.3*
- *>0.3*

+⊿ Ecosystem Respiration, %
- *<5.0*
- *10.0-20.0*
- *>20.0*

EPSG:3575
1 : 36 000 000

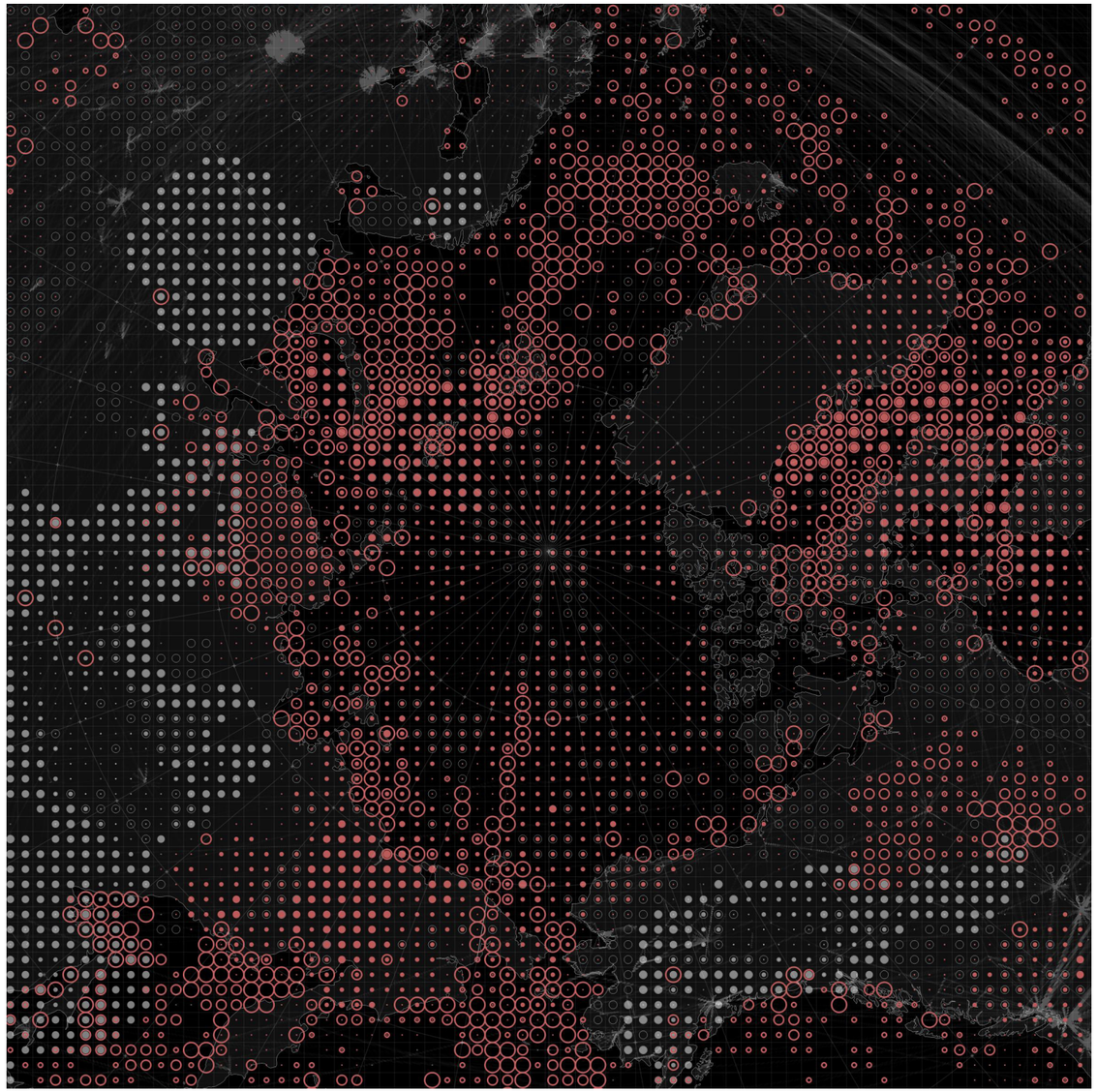
100 x 100km

Source:
C3S (2026)
NASA (2026)

Figure 44. Change in the biosphere over over a 30-year period. Significant greening and productiveness can be observed on the Russian taiga zone, and generally along flat environments within 200 km from the shoreline.

Atmosphere

⊿ Temperature & Black Carbon Emission (1990-2020)



EPSG:3575
1 : 36 000 000

100 x 100km

Source:
C3S (2026)
JRC (2025)

-⊿ Black Carbon, %
1990-2020
- *<25.0*
- *25.0-50.0*
- *>50.0*

-⊿ Temperature, °C
1990-2020
- *<1.0*
- *1.0-2.0*
- *>2.0*

+⊿ Black Carbon, %
1990-2020
- *<100.0*
- *100.0-200.0*
- *>200.0*

+⊿ Temperature, °C
1990-2020
- *<2.0*
- *2.0-5.0*
- *>5.0*

Figure 45. Change in the atmosphere over a 30-year period. Black carbon emission and regional temperature amplification along the North-west passage correlate greatly, even amidst overall significant circumpolar heating.

Deterritorialization

Biophysical Transitions

By overlapping the changing matters across ice, water, land and air and selecting the upper quantile of each, one distinguish normal noise with significant change. The conditions associated with a declining cryosphere where then selected and filtered based in a similar manner as the diagram on the right. Effectively the combined biophysical deterritorialization map showcase the overlap of Borealization of the land, Atlantification of the seas, Arctic Amplification and refraction rates of the atmosphere and the recession of the cryosphere.

The immediate conclusion here is that the immediate shorelines have historically been the most susceptible to biophysical alterations. There's a clear overlap with the emerging presence of the Northern Sea Route along the Russian Arctic, but also within Baffin Bay between Greenland and Canada.

By being a bit critical towards the data and the chosen indicators, one can also see the correlation one indicator have with another. With receding ice sheets due to an amplified warming effect., ships will follow, which again lead to black carbon emission. While the data do show the major biophysical shift per matter, they can all at times be the symptom of the same cycle.

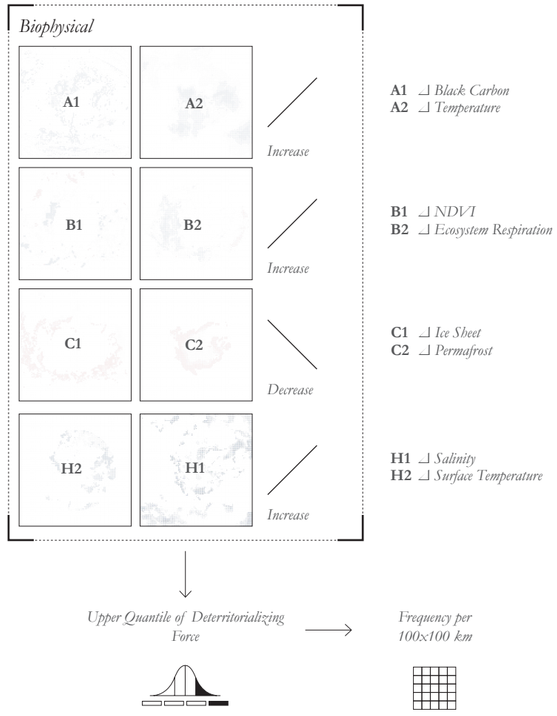


Figure 46. Selection and filtering method for the combined biophysical deterritorializing map.

Combined Biophysical Deterritorialization

Upper Quantile Overlaps (1990-2020)

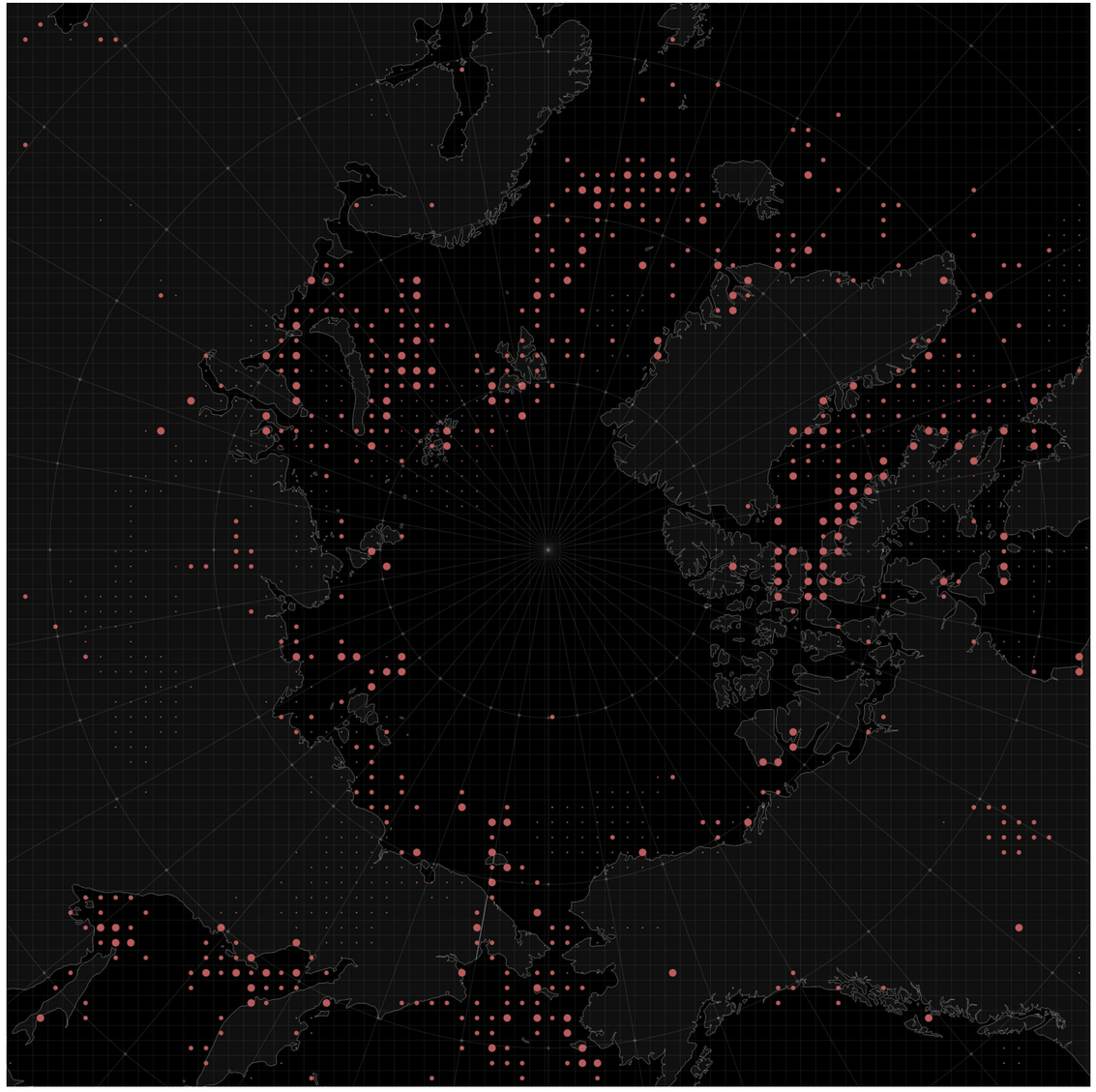


Figure 47. Combined biophysical deterritorial forces.

Territorialization

Anthropogenic Advancement

Viewing the Arctic through its biophysical properties provides a diagnosis of a territory undergoing rapid transformation. While climate change is often presented as the primary driver of Arctic change, many of its effects are inseparable from broader patterns of human intervention. Among the most significant anthropogenic forces is the northward expansion of extractive economies and supporting infrastructure.

As diminishing sea ice improves access to previously inaccessible regions, industrial activities such as hydrocarbon extraction, mining, shipping, and logistics increasingly extend into arctic land and waters. This expansion is not confined to isolated development sites; rather, it restructures the region through vast networks of ports, shipping corridors, energy installations, and resource frontiers across both land and sea. Though they differ in how each matter it utilized.

On land, new infrastructure fragments ecosystems and alters long-established ecological and social relationships. At sea, the opening of navigable passages, such as the NRS, incrementally advance towards the inner Arctic Oceans. Together, the anthropogenic territorial advancement contribute to a process of biophysical deterritorialization. The Arctic is therefore not only experiencing environmental change but also a fundamental reconfiguration of its territorial logic, increasingly shaped by external local and global economic interests.

This is not a new story at all. The Arctic have had periodic times where extractivism took a foothold, before fading away and resurfacing in a different manner within a few decades. For instance, whale hunting the early 1800's turned into coal mining in the late 1800's. Remnants of these extractive cycles still remain in the Arctic, but the enclosing industrial advancement are now, in a globalized world, a global matter.



Figure 48. Dynamite from an abandoned arctic mine.



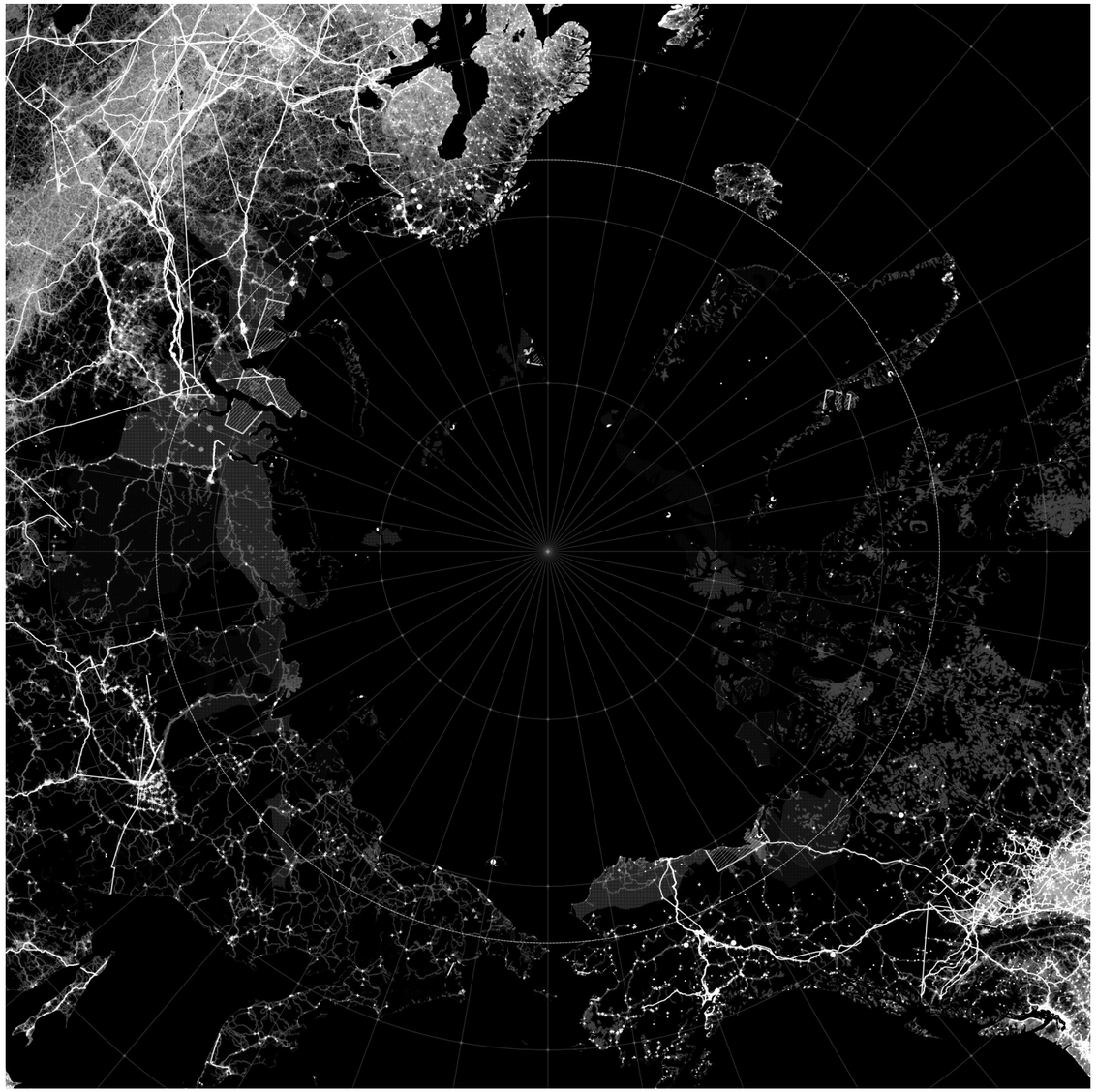
Figure 49. Coal miner's workbench.

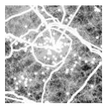


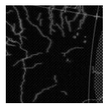
Figure 50. The former company town of Longyearbyen, Svalbard. Remnants of its extractive past still linger heavily in every part of the urban fabric.

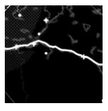
Terrestrial Urbanization

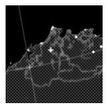
Human Footprint Index & Extractive Infrastructure



Urban Core


Urban Hinterland


Hydrocarbon Pipeline


Extraction Sites


Extractive Land Lease


EPSG:3575
1 : 34 000 000

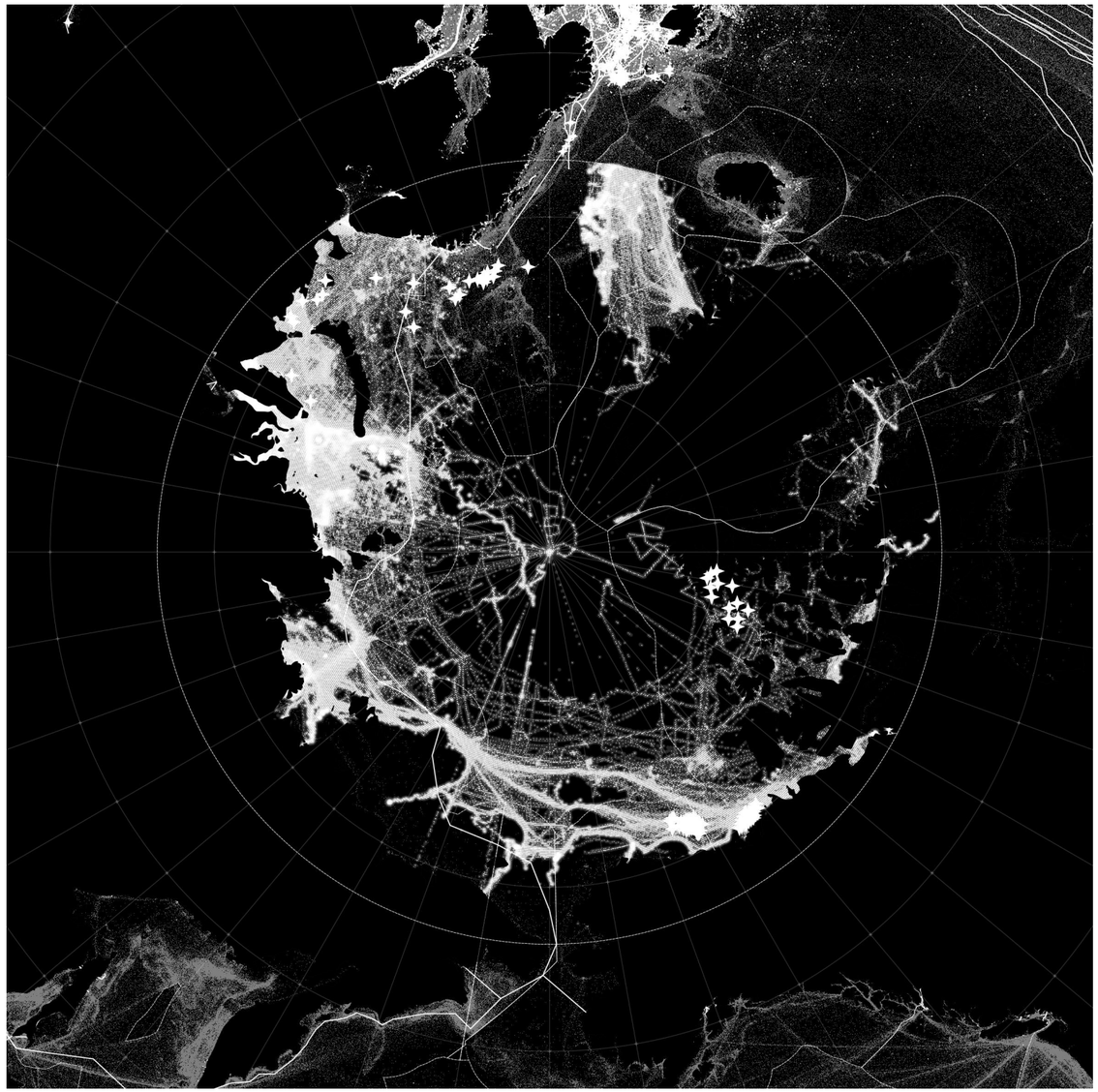
100 x 100km

Source:
ESRI (2023, 2025)
WCS (2021)

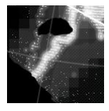
Figure 51. Territorialization, or rather urbanization, on land in terms of intensity of human activity and networks of extractive industries. Traces where human activity have caused significant alterations to the land.

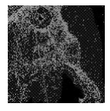
Marine Urbanization

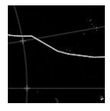
Shipping Density, Offshore Infrastructure & EEZ



Offshore Platform


Route Formation


Shipping Presence


EEZ


Sub-sea Cable


EPSG:3575
1 : 34 000 000

100 x 100km

Source:
IMF (2021)
GeoNorge (2025)

Figure 52. Anthropogenic territorialization of the sea. From fixed offshore structures such as pipelines, telecommunication cables and platofrms, to mere presence of passage in terms off fishing and passage of ships.

04 - Material

Iceland

Greenland

Protected Areas

Whale hotspot

Canada

United States of America

International Water

EEZ

Sweden

Norway

Finland

Russia

Shipping Presence

Russia

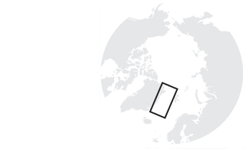
Reduce the Growing Intrusion Into Arctic Waters

DEMARK OPERATIONAL LIMITS TO ACTIVITES

Biophyisical deterritorialization and anthropogenic territorialization

Degree of Reterritorialization

The Many Arctics Within



Greenlandic Sea



Figure 53. Reterritorial forces in the Greenlandic Sea.

The Greenlandic Sea, and the only deep-water corridor into the Arctic Ocean, is Informed greatly by the international status of its water. A significant amount of ship traffic related to fishing occur, in combination with an increasing commercial traffic related to tourism and science.



Arctic Archipelago

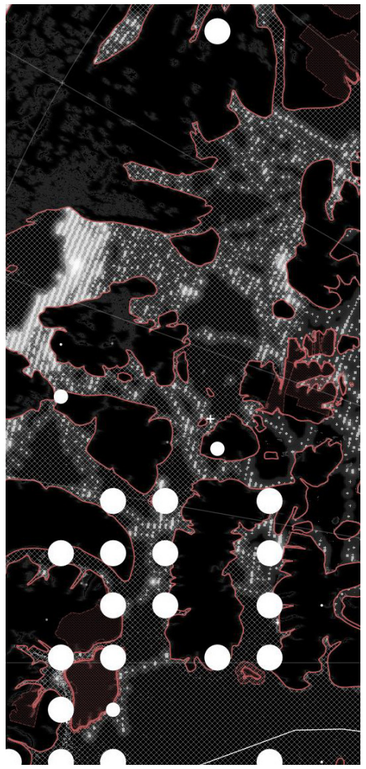


Figure 54. Reterritorial forces on the Arctic Archipelago.

The Arctic Archipelago, consisting of a complex network of islands and waterways in northern Canada. It is strongly influenced by its strategic position along the Northwest Passage, though with limited current traffic volume. A significant migrational bridge from the low-Arctic to high-Arctic, containing several ecological bottlenecks for marine life.



Central Arctic Ocean

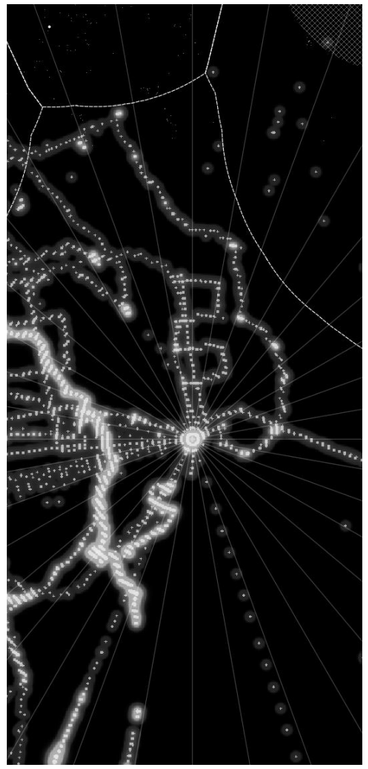


Figure 55. Reterritorial forces in the Central Arctic Ocean.

The Central Arctic Ocean, a deep-water basin around the North Pole, lie beyond the jurisdiction of most coastal states. Maritime activity remains limited due to persistent sea-ice cover, but scientific research, environmental monitoring and expedition-based tourism are still prevalent. Most of which is supported by the international status, though not protection, of the water.



Barents Sea

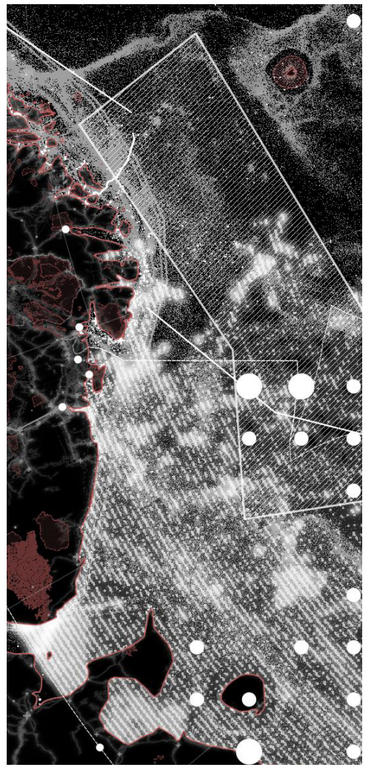


Figure 56. Reterritorial forces in the Barents Sea.

The Barents Sea, located between Norway and Russia, is strongly influenced by its role as a gateway between the North Atlantic and the Arctic Ocean. A significant amount of ship traffic related to fishing and resource extraction occurs, alongside increasing commercial activity associated with tourism, scientific research, and Arctic transit shipping.



Kara Sea

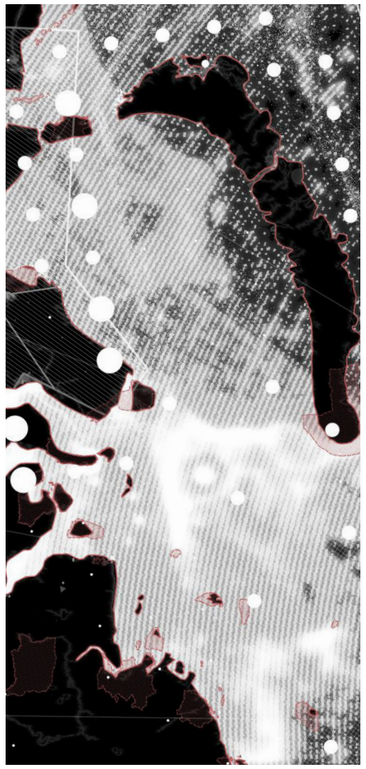


Figure 57. Reterritorial forces in the Kara Sea.

The Kara Sea, situated north of western Siberia, is greatly influenced by its strategic importance for Russian Arctic development and the Northern Sea Route. Considerable vessel traffic associated with hydrocarbon and energy production, and cargo transport occurs, accompanied by growing scientific and environmental monitoring activities.



Chuckchi Sea

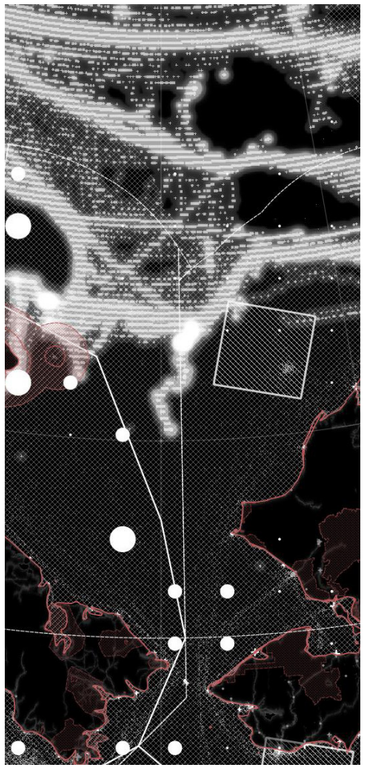


Figure 58. Reterritorial forces in the Chuckchi Sea.

The Chukchi Sea, connecting the Pacific Ocean to the Arctic Ocean through the Bering Strait, is greatly influenced by its role as a future major international maritime corridor. The Bering Strait will become its major bottleneck as the only fixed entry/exit point into the Arctic, although its depth is limited compared to the Greenlandic/Bering Sea.



Figure 63. Location: Varandey, Russia.

Infrastructure on the Cryosphere

A Port Dilemma

Given the amplified climate effects situated in the Arctic, shorelines are becoming more exposed to warming waters and ice-free days. While this have led to developments or expansions ports with a wider operational window, it also expose the same infrastructures to coastal erosion and inland permafrost thawing. The aforementioned interrelation between land, water and air culminate here to a negative feedback loop for the port's existence. Additionally, any infrastructural collapse could also negatively impact the local ecosystem.

As seen in ***figure 59-62***, a shallow-shore port in the easternmost part of the Barents Sea, Varadey, can through satellite imagery tell three things:

1. how fluctuating the warming shore is in terms of sedimentation flows
2. how that affect the navigable spaces towards the more open seas
3. how cargo contaminants over time seep into the river mouth and the seas.

On land, developments manifest through rigid structures, which are projected to be exponentially more expensive with maintenance issues (Cordier, 2025).

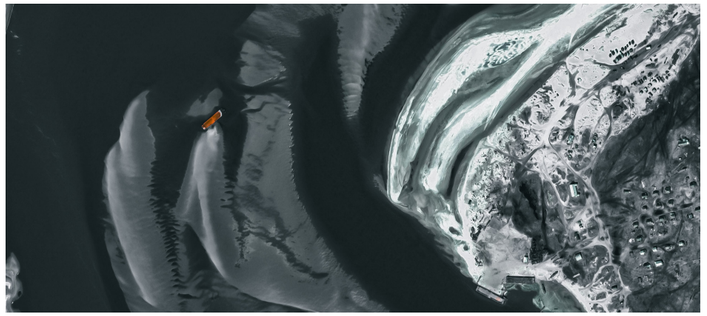


Figure 59. Impact (2003). From Google Earth.

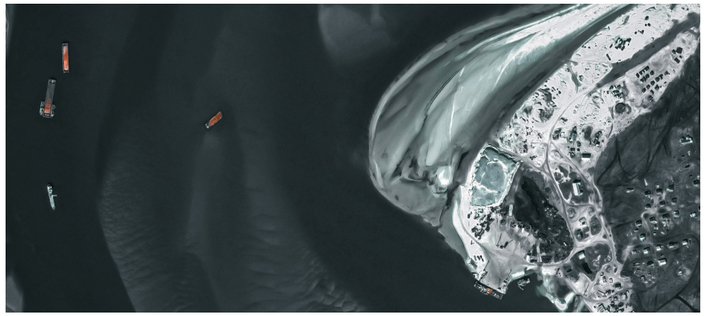


Figure 60. Abandoned (2007). From Google Earth.

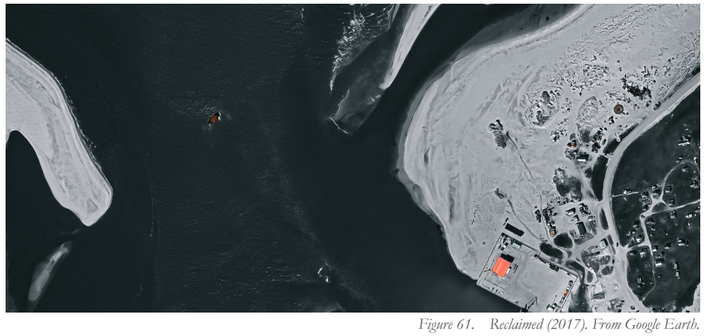


Figure 61. Reclaimed (2017). From Google Earth.



Figure 62. Engulfed (2020). From Google Earth.

500 m

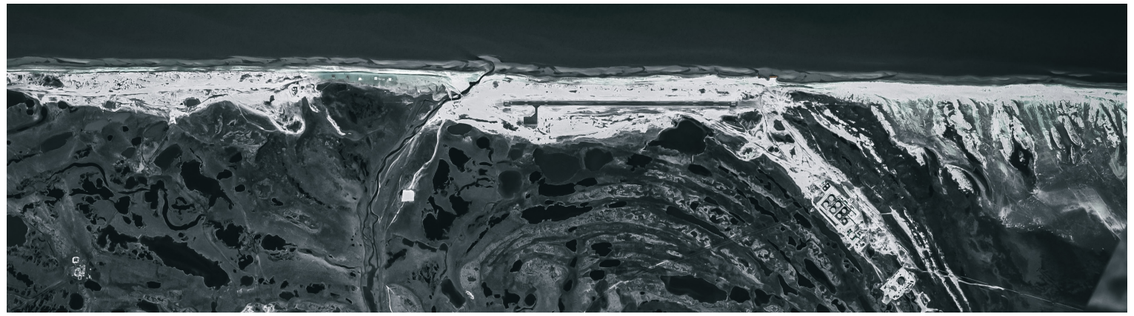


Figure 64. Initial development (2004)

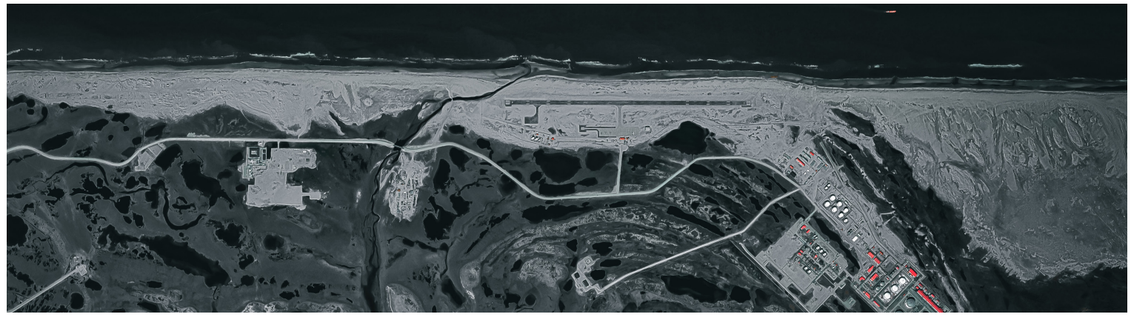


Figure 65. Operational hydrocarbon facility (2017). From Google Earth.



Figure 66. Coastal erosion posing higher risk (2020). From Google Earth.

1 km

The current ports also rarely operate without an extensive industrial backdrop to it. Today, that is largely a web of hydrocarbon wells and pipelines, all susceptible to the changing permafrost conditions too. As seen through ***figure 64-66***, located a few kilometers away from ***figure 59-62***, its industrial hinterland stretch around 60 km inland if one measure the longest coherent pipelines. If one measure it from the main origin of ships, then Varandey is connected to the Ob river beyond the Ural mountains, almost 440 km in air distance. It is one of several small nodes meant to transport hydrocarbon to western Russia, but also as a stepping stone for shipments, crew and air services.

The realm of the Arctic and offshore urbanization is therefore not simply to the shoreline, but also the deeper into immediate terrestrial hinterland. To enable Arctic agency, one must therefore be able to mediate the industrial activities that eventually find their way to the sea. Either directly with infrastructure, or indirectly through its pollutants and environmental degradation.

Non-human Territoriality

Northbound Ecologies

Humans are not the only species claiming more land within the Arctic. Migration shifts on terrestrial, marine and aerial levels follow the aforementioned biophysical shift. Borealization of the land and Atlantification of the seas are processes used to the describe the ecological transition along the borderscapes. While some species can coexist, at times with a reduced population, others will directly compete. Such is the case for the red fox and the arctic fox.

For many indigenous communities, the migration shift on whaling, fishing and reindeer, both for herding and hunting, is of extreme relevance for sustained existence. Given the concurrent reterritorial processes and the geomorphological structure of the Arctic, this will ultimately lead to a habitual squeeze along the shorelines and continental shelf. A prime example of this can be seen through the Arctic's own charismatic megafauna, particularly the polar bear and the arctic fox. For both, ice-coated shorelines is the preferred niche and the means of passage. Given the emerging cryospheric split between the marine and terrestrial, a territorial split is likely to follow.

For an adequate instrumentalization of Arctic agency, one must therefore include the immediate shoreline and its hinterland both on land and in the sea. Non-human actors exist on each side and, as shown, on both. Any offshore urbanization process must therefore recognize these actors, the transitions they are under and seek to not apply further pressure on critical habitats.

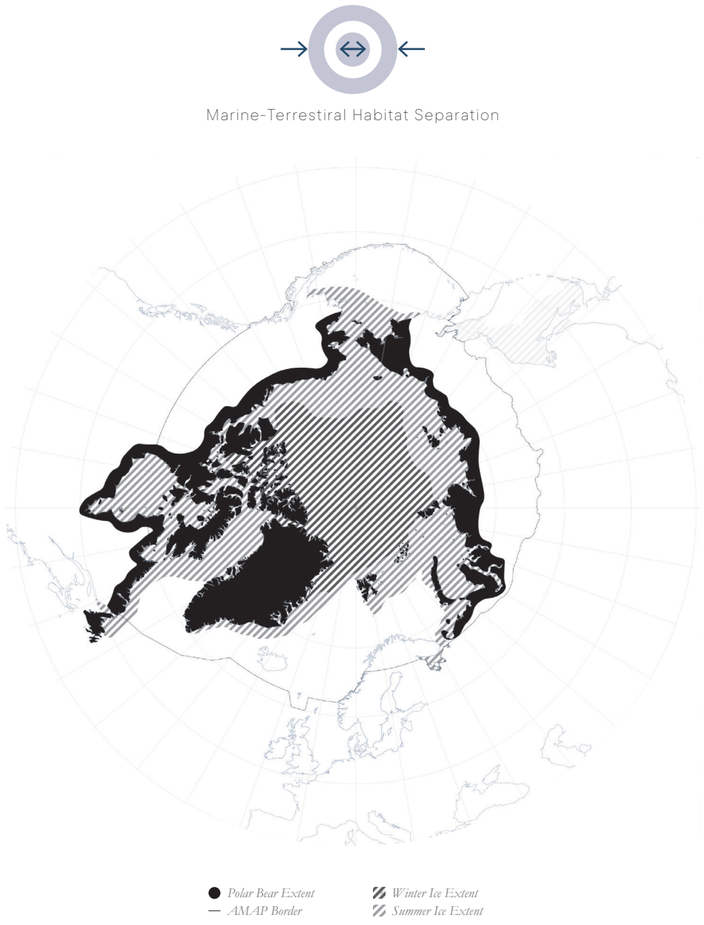


Figure 67. Polar bear distribution. Ice is, unlike perceived for human usage, seen as a bridge rather than an obstacle.



Figure 68. Grey wolf distribution with sub-specie in darker shade.



Figure 69. Lynx distribution, European and Canadian sub-specie.



Figure 70. Reindeer/caribou distribution.



Figure 71. Red fox distribution.



Figure 72. Moose distribution.



Figure 73. Polar fox distribution.

Non-human Territoriality

Contested Shorelines

Northbound Species

While it is beyond the scope of the project to tackle in detail, being aware of the projected ecological transitions is key for to tailor programs to context in the long run. Again, the notable being a shift in reindeer hunting grounds, but other unknown effects will occur with a boreal-arctic transition on land and in the sea.

High-North Residents

competitive exclusion



Figure 74. Red fox (Vulpes vulpes)



Figure 75. Eurasian grey wolf (Canis lupus lupus).

predation

predation

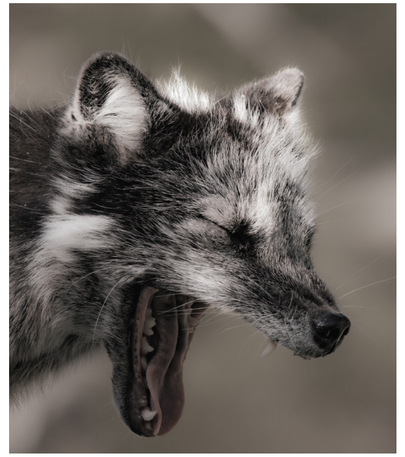


Figure 77. Arctic fox (Vulpes lagopus)

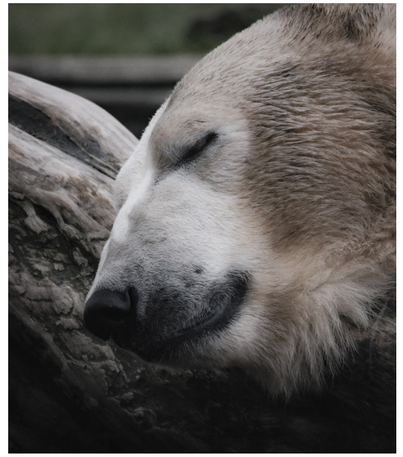


Figure 78. Polar bear (Ursus maritimus)

resource contestantant

resource contestantant

resource contestantant



Figure 76. Moose (Alces alces)



Figure 80. Reindeer (Rangifer tarandus)



Figure 79. Eurasian lynx (Lynx lynx).

conflict on habitat alteration from a High-Arctic towards Sub-Arctic

Mediating (Eco)nomical Rights of Presence & Passage

ADDRESS MORE-THAN-HUMAN TERRITORIALITY WITH ADAPTIVE PROGRAMMING

Human and non-human territoriality and presence along the Arctic coastal ecoregions

Figure 81. Eurasian lynx.

Seasonality

Operating Throughout Seasons

To fully understand the Arctic and its complexities will be a never-ending search. However, how it shape social, economic and ecological aspects can be viewed in relation to the seasonality (Cadman et al., 2025). Migration patterns enable seasonal fishing, and the ice conditions enable how to do so. Ice is the absolute informant of any Arctic activity. A close second, and highly interlinked, is the daylight rhythm. Specific behaviors have to be catered during the polar night, as well as polar day.

Life have adapted to these conditions, for example with the life cycle of polar phytoplankton, and so any alterations to this rhythm is of great disturbance. Light and sound pollution being arguably the two most potent disruptions, directly correlating to the degree of arctic and offshore urbanization seen since the early 20th century. This is a vital component when planning for future large-scale presence in the Arctic and where it should be places, as well as the appropriate programming.

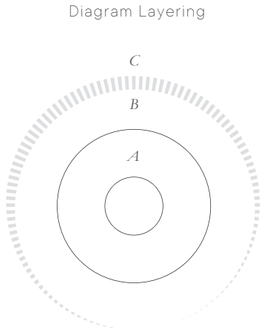


Figure 82. Layering of the seasonality calendar.

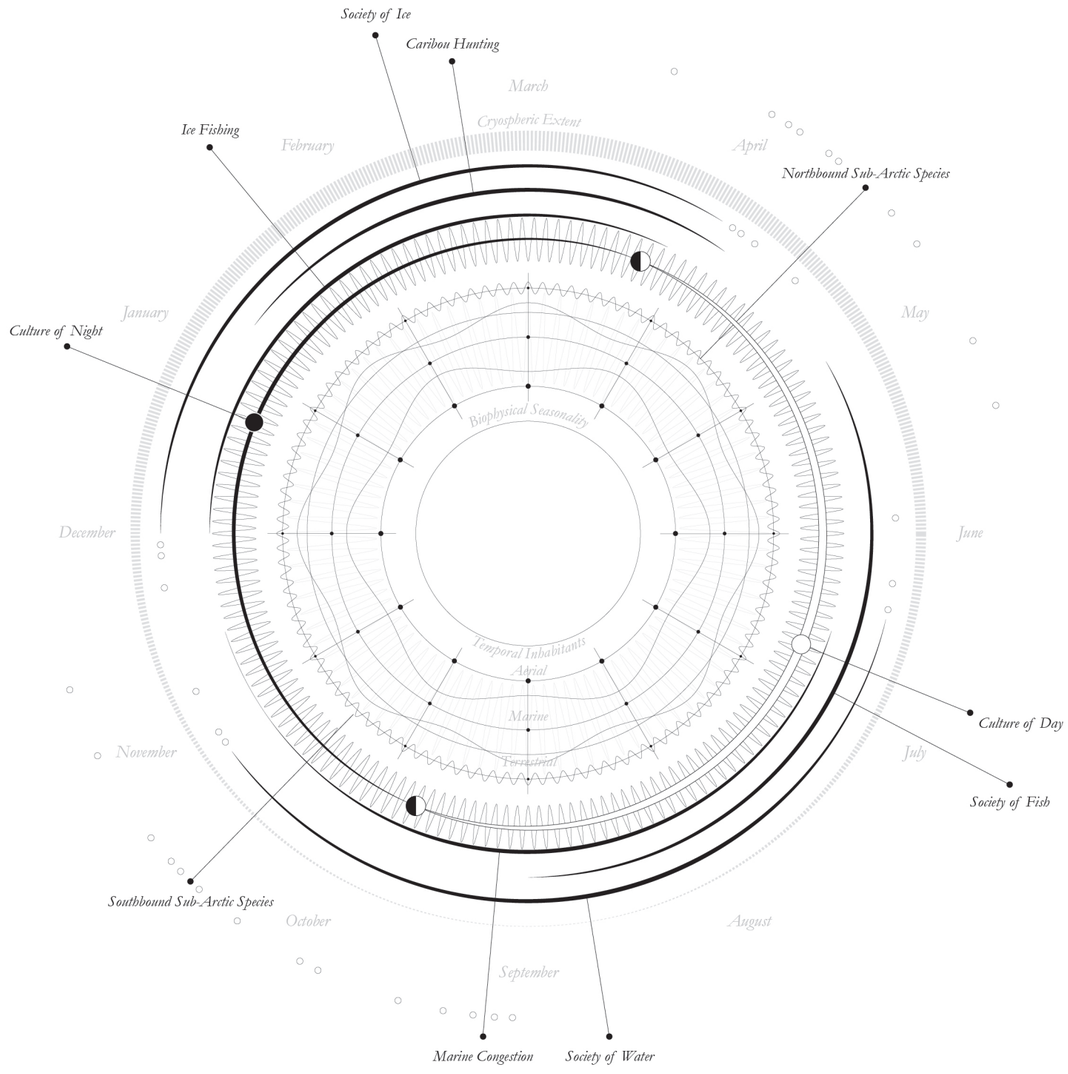


Figure 83. Simplified and abstracted seasonality calendar of circumpolar activites and the constantly changing inhabitation of species (Cadman et al., 2025; Charlie et al., 2022)

Photographic Juxtaposition of Seasonality

The Biophysical Conditions

The landscape inform the operations on it. Given the extremes of the Arctic, that can result in major activities being restricted to only a few months a year. Any produce harvested stem largely from southern sources, with notable exceptions being mushrooms and berries. Still, the largest native source remain on fish and meat.

Boreal-Arctic Summer



Figure 84. Mountainous boreal landscape observed just above the tree limit (~1 100 m). Shrubs flourish with sufficient soil depth and quality..

Figure 86. Location: Lower Scandinavian Mountains, Norway.



Figure 85. (a.b.c) Main characteristics of the boreal zone, from coniferous vegetation, to bogs and wetlands. Depending on soil quality, precipitation and altitude, the tree line and its gradient

Figure 89. Location: Svalbard, Norway.

During winter, fishing and tourism drive many communities. Between summer and winter, many local societies will transition to a seasonal ice-based state. Frozen rivers can be crossed, and activities such as fishing, trade and construction have to adapt.

High-Arctic Winter



Figure 87. (a.b.c) Main characteristics of the High-Arctic zone, from permafrost, snow-dapped lands, to northern lights.



Figure 88. Mountainous High-Arctic landscape and means of transport observed just above shore (~50 m). Backdrop of more significant elevations.

Photographic Juxtaposition of Seasonality

Low-Arctic Transit Hub

The coastal settlement Mys Shmidta is located along the Chukchi Sea as a transit hub for exploration and tourism on Wrangler Island. Historically, it was established as a nodal point for an Arctic airport network. Due to the limited and declining extractive activities on the area since the fall of the USSR, it has been used as a monitoring base for Northern Sea Route activities. For that, this small transit hub represent one possible programmatic role transformation that align with the seasonal environment both on a local and territorial scale.

Figure 93. Location: Mys Shmidta, Russia.

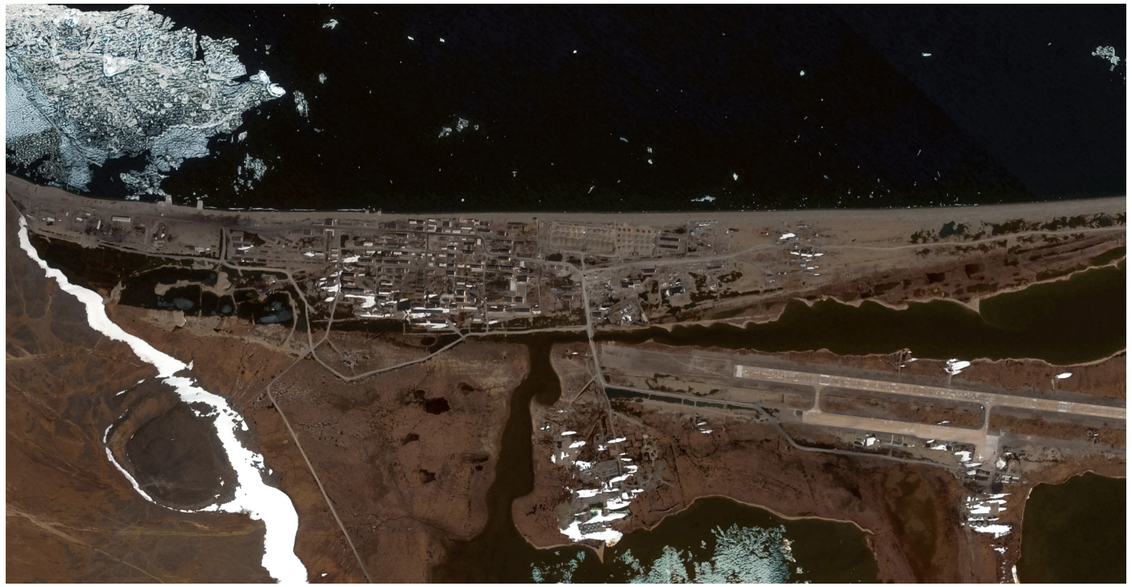


Figure 90. Mys Shmidta during the summer season with partially open seas. Shipping and air travel to Wrangel Island being the main purpose of the settlement today (Google Earth, 2022).

1 km



Figure 91. Mys Shmidta airport in operation during the summer season (Google Earth, 2022).

1 km



Figure 92. Mountainous boreal landscape observed just above the tree limit (~1 100 m). Shrubs flourish with sufficient soil depth and quality (Google Earth, 2024).

1 km



Figure 94. Ice breaker and crago ship maintaining a signular route across the ice-capped waters (Google Earth, 2024).

1 km

Photographic Juxtaposition of Seasonality

High-Arctic Transit Hub

Located only slightly higher north than Mys Shmidta, this industrial port in central Novaya Zemlya highlight the persistent demand for an all-year maritime access. Icebreakers, as seen in *figure 97 & 99*, are essential so upkeep such routes. From the perspective of Arctic territoriality, this is the epitome of anthropogenic territorialization. While the icebreaker and its path is relatively tiny to the broader context, it is a fragmenting force of ice nonetheless. Shipping volume and proximity to the cryosphere's edge determine whether this logistical scar heal or widen. This site represent how economic interests are capable of overpowering the Arctic's own 'claim' through brute force.

Figure 98. Location: Novaya Zemlya, Russia.



Figure 95. The Port during summer with completely open waters (Google Earth, 2025).

1 km

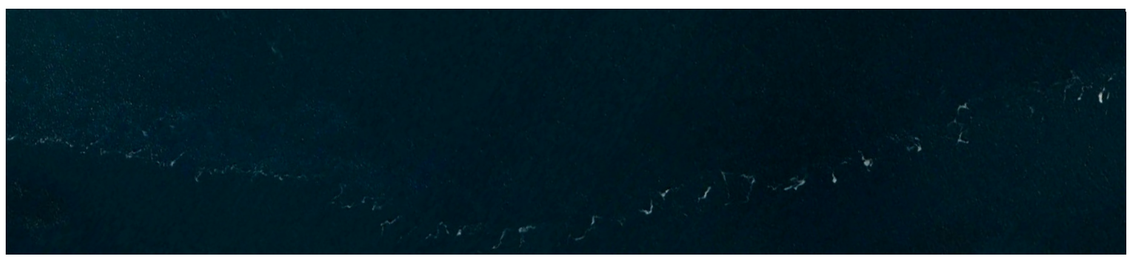


Figure 96. Open waters with flexible routes (Google Earth, 2025).

1 km



Figure 97. The port during winter with completely closed waters. Quintessentially, the anthropogenic forces, here the icebreakers, breake that stable state of the Arctic (Google Earth, 2021).

1 km

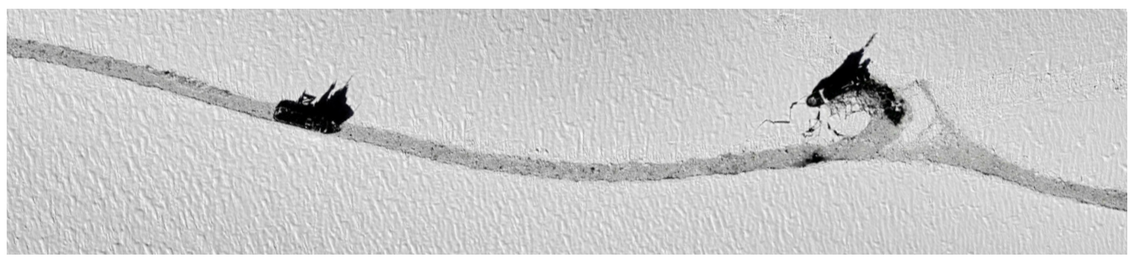


Figure 99. Ice breaker and crago ship maintaining a signular route across the ice-capped waters (Google Earth, 2021).

1 km

Celestial Border

The Arctic Circle

How to delimit the Arctic has been a recurring, and persistent, problem (Nanni et al., 2024). Regardless, a common demarcation is the one made by the sun, where polar night and day occur. The Arctic Circle, at 66°33'50.9" N, intersect most of the pre-established Arctic boundaries through nation states and the Arctic Council's own working groups. For that, it is used as the cutting plane for the following 'section of the Arctic'.

Still, it must be emphasized that the Arctic cannot be contained within a fixed, given boundary. Therefore, the section intend to represent the matters flowing in and out of a complex system, rather than representing a true edge- or border condition. The section address the critique on Arctic delimitations by the late Canadian geographer Louis-Edmond Hamelin on two key points:

1. single-factorial definitions in isolation cannot be expressive for the [Arctic] region as a whole
2. extent-based border delimitation cannot contain the fluidity of its measure, nor .address gradients of it.

While Hamelin addressed this by indexing multiple biophysical and anthropocentric criteria, known as the The Nordicity Index, or the Polar Value (VAPO), its terrestrial limitation put it outside of the scope of this research. Regardless, Hamelin's work serve as a great basis for understanding the Arctic through its own terms and conditions from where the Arctic as territory can be established.

A key observation to make from the following section is that the Arctic only have one deep-sea entrance- and exit point. It pass along the Greenlandic-/ North Sea, providing the most significant inputs and outputs between Arctic and sub-Arctic regions. The Atlantic entry gate see the greatest political and infrastructural complexity levels across the section, rivaled only by the Pacific entry gate along the Bering Strait. These areas, in combination with other shallow bodies of water, are also experiencing the greatest biophysical alterations. An assumption to make on this overlap it that these points will be the most significant intrusion points in the Arctic, from the reference of the Arctic circle. This prompt two further observations:

1. the border intrusions on land are nationally isolated
2. the border intrusions on sea are internationally driven

Both the Atlantic and Pacific entry gate to the Arctic are essential migration bottlenecks, so an act of mediating it with the Northern Sea Route is of upmost importance. Additionally, with the general flow of the Arctic from a marine perspective, one can observe the Arctic as a gradient between the two gates and the inner Arctic Ocean. For instance, the state of the North Sea is projected to become the state of the Barents Sea, which again in the far future could become the state of the Kara Sea. Exploring the gate points from a territorial perspective is therefore of great significance to establish and cater for the deeper and more isolated regions.

"There are many norths in this North."

Luis-Edmond Hamelin,
in Nordicité canadienne (1975)

Section Structure

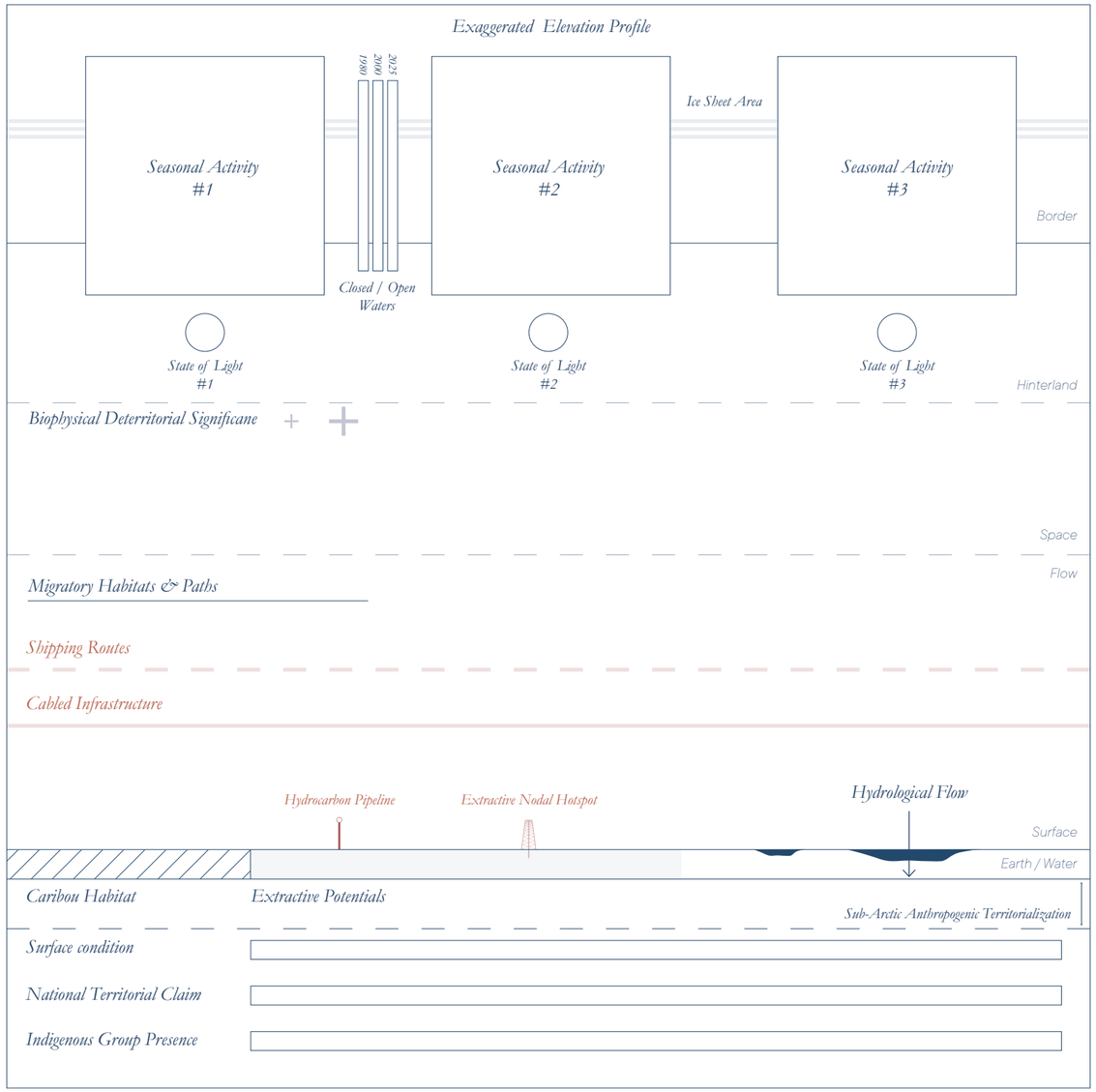


Figure 100. Structural overview of the section along the Arctic Circle. Aspects such as biophysical, ecological and socio-economical flows are represented, as well as more fixed conditions politically and environmentally. It span across time and space repsectively on each half-side to encapsulate the biophysical seasonality of the region, the operational usage of it and the contextual relations they have. For example how the rate of melting water relate to the maximal cryospheric extent and economical activities later on.



January
February
March
April
May
June
July
August
September
October
November
December
Ice Sheet Area
Peak Polar Night IR Monitoring
Peak Northern Light Tourism
Peak Cryospheric Extent
Peak Terrestrial Freshwater Reservoir
Peak Hydrological Transition
Peak Solar Radiation
Peak Marine & Terrestrial Productivity
Peak Shipping Activity
Minimum Sea Ice Extent
Storm Season
Caribou Harvesting
Nocturnal Nature-cultural Activities
Total Sea Area
Ice Sheet Area
Polar Night
Astronomical Twilight
Blue Hour
Sunrise
Golden Hour
Midnight Sun
Sunset
Marine Migratory Zone
Extreme Tundra Borealization
North-east Passage
North-west Passage
Caribou Habitat
Reindeer Habitat
Exclusive Economic Zone
Transpolar Current
Telecommunication Cable
Beaufort Gyre
North Atlantic Current
Siberian Cold Water
Extractivism
Bering Strait
Russia
Land
Water
Russia
United States of America
Canada
Greenland
Iceland
Norway
Sweden
Finland
RAIPON
ICC
GCI
Inuit Circumpolar Conference (ICC)
Saami Council (SC)
Russian Association of Indigenous Peoples of the North (RAIPON)
Arctic Athabaskan Council (AAC)
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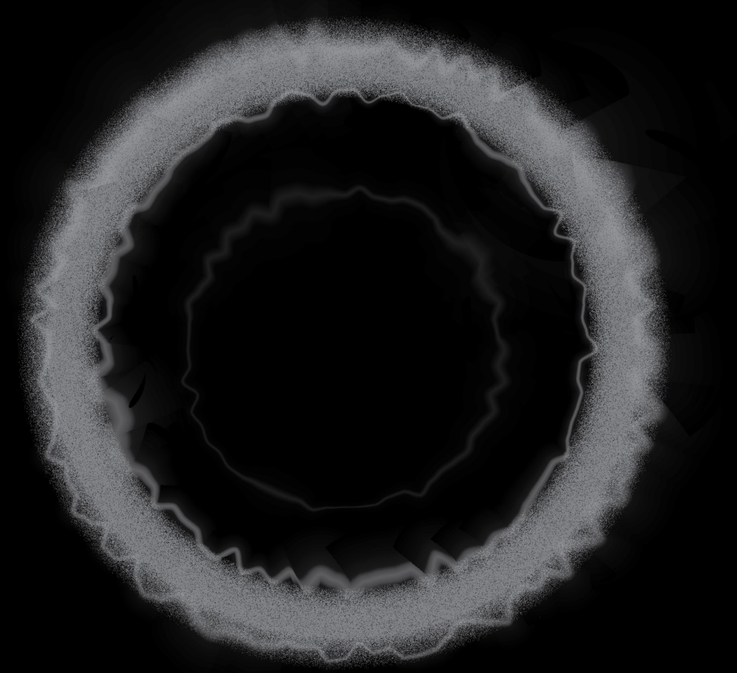
Enclosure

Design Rationale of The Nodal Border

delimit
within
mediate
without
protect



We have the technology to physically enclose it, we have knowldege to put it on 'life support', and the eye can perhaps be tricked by the transparency of glass, but the ultimate fallacy of enclosure reverberates in that eerie silence, an emblem of disconnection.

Aleksandra Jaeschke,
In Praise of the Open

Elegy of the Arctic

When the Planet Lost its Mind

Yesterday, the only lights at night on the horizon would be celestial objects. We changed that. We ventured out to create extensions of our immediate habitat, our back facing the land. You, the unbreachable icy waters, held resources which no nation could ever contain alone, yet we all tried. We made our stops along the one of your many paths, this one we coined 'north'. We depend on you, yet we cannot live in your domain by ourselves alone. Our platforms, our mechanized land, our artificial island: that became our gateway to you. And so we built.

Today, we have built our way to your outer rim as we look further and further inn. When we didn't change, you did. You stepped backwards and we followed. Your blinding surface blocked our advancement, until we lost sight of it. It must have meant we could advance once again. And so we built.

Tomorrow, we look to our sides before extending the lines yet again. By now we are closer to eachother than anything else. We split the final section into slices so thin that no map could ever separate them. Yet, you didn't follow them. You never did. And when we enclosed you, replicated you, mechanized you, we stopped. We had chased you to get more, then to know more, then to remember. Now, we won't forget yesterday knowing that you can't recall tomorrow anymore.

Manifesto

The sea is urban, and we made it that way. We have treated it as an extension of our terrestrial claims, and by doing so we have neglected water's inherent dynamism. The inhabitants of the Arctic Sea are temporary, and so is its state. Our pragmatism, the embodiment of the 20th-century's maritime division and expansion, must be met with a counter-force. Northbound developments must be able to see the many Arctics within its perceived monotonicity. Not only in plan, as traditional ways call for, but in verticality.

We must recognize the intrinsic multiscalar roles of the region, from the biochemical values of its near-molecular matter to the climatic power it has on a planetary scale.

We must reject the superimposed and fixed Westphalian-based enclosure of the Arctic, and embrace the fluidity that comes with it through various time-scales.

We must bring forth a new kind of mechanization, one which does not compromise on the values of the region's inhabitants. Humans and non-humans alike, through the matters of land, sea and air.

Lastly, we must bring a halt to the exploitative nature of our mechanized offshore extension. It is time for the urban at sea to synchronize with it. From extensions to bastions, our maritime urban environment must become a defense against ourselves.

An Arctic Counter-force

The Nodal Border

The challenges imposed on the Arctic from an environmental and territorial perspective are immense and highly complex. Due to that, any propositions aimed to alter the status quo must be tackled acupuncturally with a systematic logic. An inherent necessity for a recognized and manageable Arctic territory is a clearly defined border (Oström, 1990). That brings in the paradox an Arctic Territory, as maritime dynamism and Westphalian staticity meet. This can be circumvented by shifting the weight from the latter to the former.

The boundary is offshore, beyond the Westphalian point of origin, and the border cease to be a line but a point. A leverage point, in a literal and representative sense. Therefore, the proposition to create an Arctic territory, and in so an anthropogenic counter-force, will be through a nodal-based border delimiting anthropogenic territorialization.

An assumption made throughout the entire work has been, and will continue to be, that the Arctic is changing while the endless societal desire towards optimalization will not. Therefore, in the realm of maritime anthropogenic territorialization in the Arctic, the project will not envision a complete removal of the Northern Sea Route. Instead it will seek on how it can be constrained in such a manner that it does continue the rapid enclosure of the Arctic towards a Transpolar Route. Rather, the border's function is how the Arctic can enclose the NRS beyond ice.

With or without an altered NRS, the Arctic is projected to reduce significantly in size if measured by the cryospheric extent. Since the ambition of the nodal border is to be a pushback against anthropogenic forces, it cannot be tied directly to the ice itself. Other biophysical conditions must be the informants for Arctic, which now notably see its definition expand beyond the cryosphere.

It was established in the theoretical underpinnings and conceptual framework that the necessary components of an Arctic territory comprise of three elements: intrinsic material power, political recognition and spatial configurations. The nodal border, specifically the nodes themselves are a direct measure on the first and third point. The second point will come from the integration of each nation state within the nodal border, through an international ownership of nodes.

Lastly, and returning to the systems logic, the nodal border must represent certain acts greater than just being an arbitrary set of points along the Arctic shoreline. The proposition as a whole should, as the inherent systematic shift it proposes to be, follow as set of target points. System analyst and environmentalist Donella Meadow proposed a set of twelve leverage points on how to intervene in such complex systems. In the evaluation later on, these points will become the assessment criteria for the overall nodal design, but first they will be applied in establishing the territorial logic.

Donella Meadow's Twelve Leverage Points for System Intervention:

1. Power to transcend paradigms
2. Mindset or paradigm that the system
3. Goal of the system
4. Power to add, change, evolve or self-organize system structure
5. Rules of the system (incentives, punishment, constraints)
6. Structure of information flow, or access to information and knowledge
7. Gain around driving positive feedback loops
8. Strength of negative feedback loops, relative to the effect they are trying to correct against
9. Lengths of delays, relative to the rate of system changes
10. Structure of material stocks and flows
11. The size of buffers and other stabilizing stocks, relative to their flows
12. Constants, parameters & numbers

From 'Thinking in Systems: A Primer' (2008) by Donella Meadows

Nodal Networking
Territorial Transit Field

Anchoring
Mediator

Distance to Solid Matter
Terrestrial-Marine Border Typologies

Existing Offshore Platforms
Alter + Remove

Planetary Assemblage
Pressing Forces

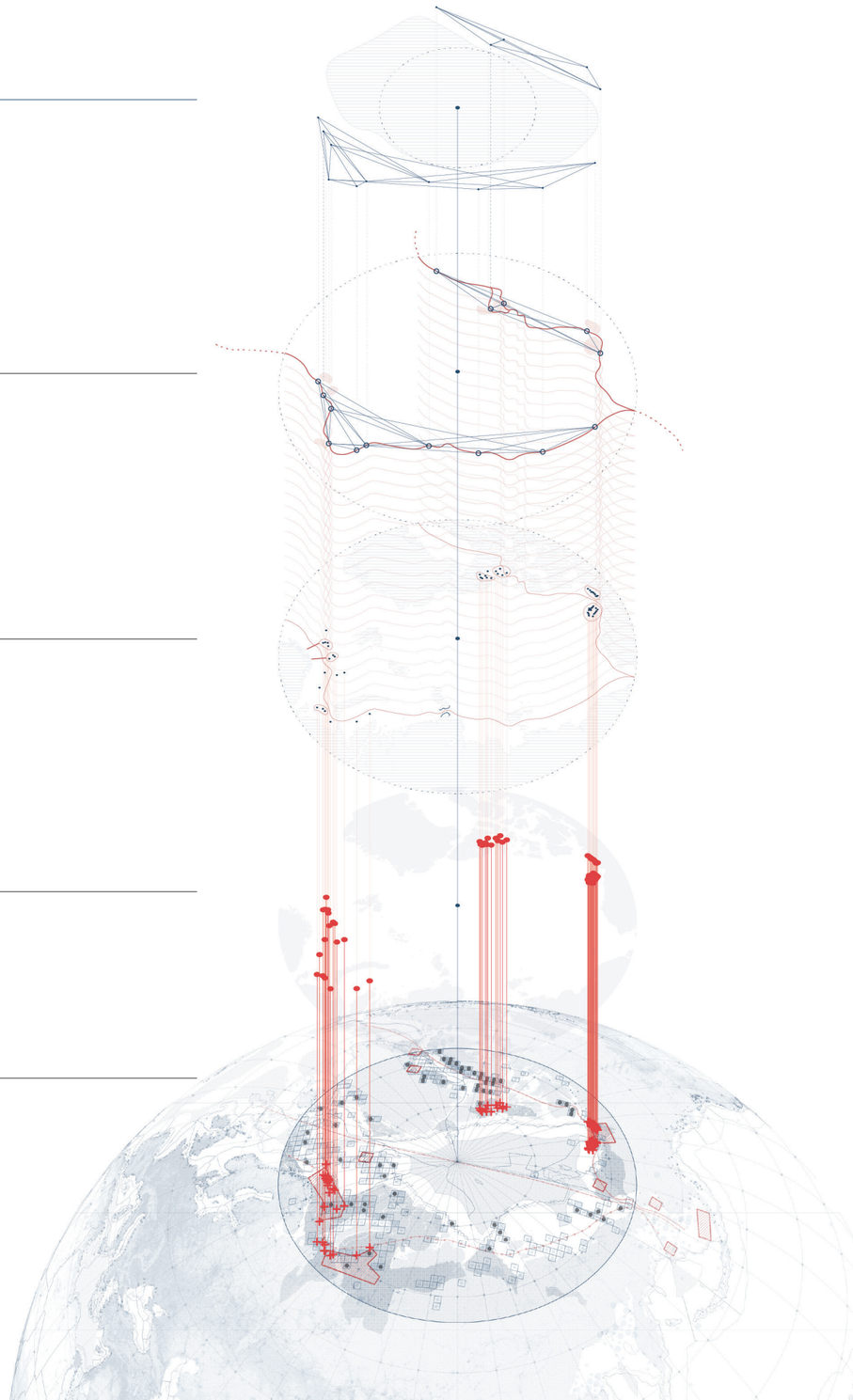


Figure 101. Territorial proposition outline, here illustrated on the current state of the Arctic

30-year average of biophysical deliminators

Environmentally Informed Nodes

Biophyical Demarcations

First of is setting up the nodal environmental demarcations. Given the need for the Arctic to be more-than-ice, various other biophysical indicators have been mapped out. In part from Hamelin's Nordicity criteria and in part from other self-discovered significant criteria, such as the celestial and bathymetric delimitators. Each delimitator correspond later to a nodal typology or an operational condition. The main point here is to acknowledge the Arctic as a gradient of gradients across an imagined Nordicity 2.0 index. None are ever a single dominant Arctic boundary, as that will effectively be the nodal border. Instead, these borders function to debunk the notion of 'One Arctic', and to reduce the chance of a one-fits-all approach to the nodal typology.

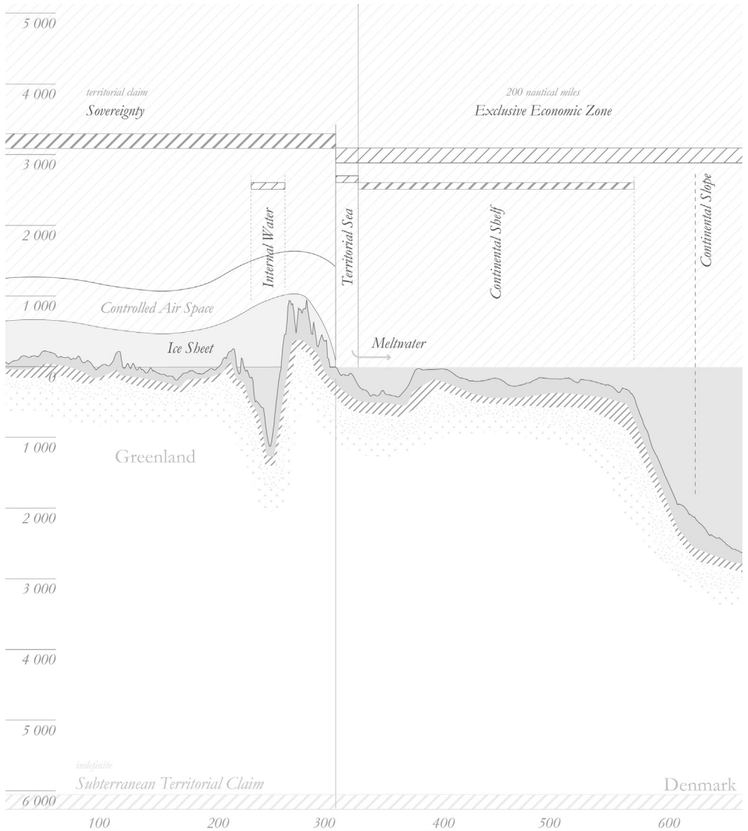
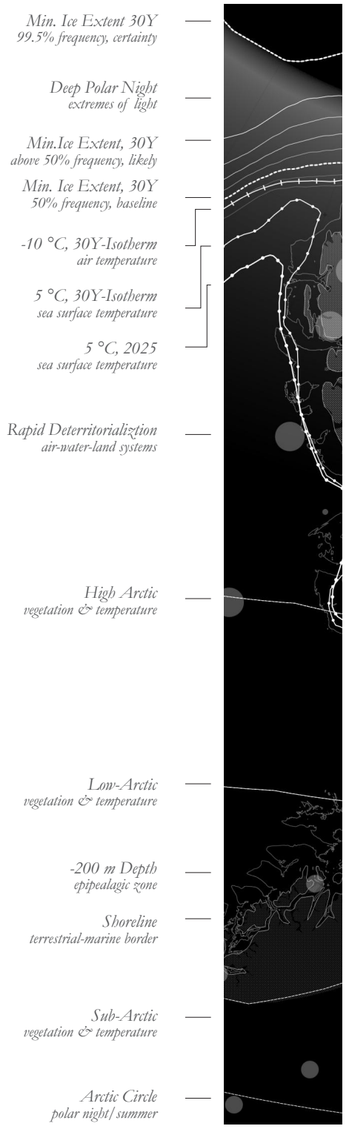
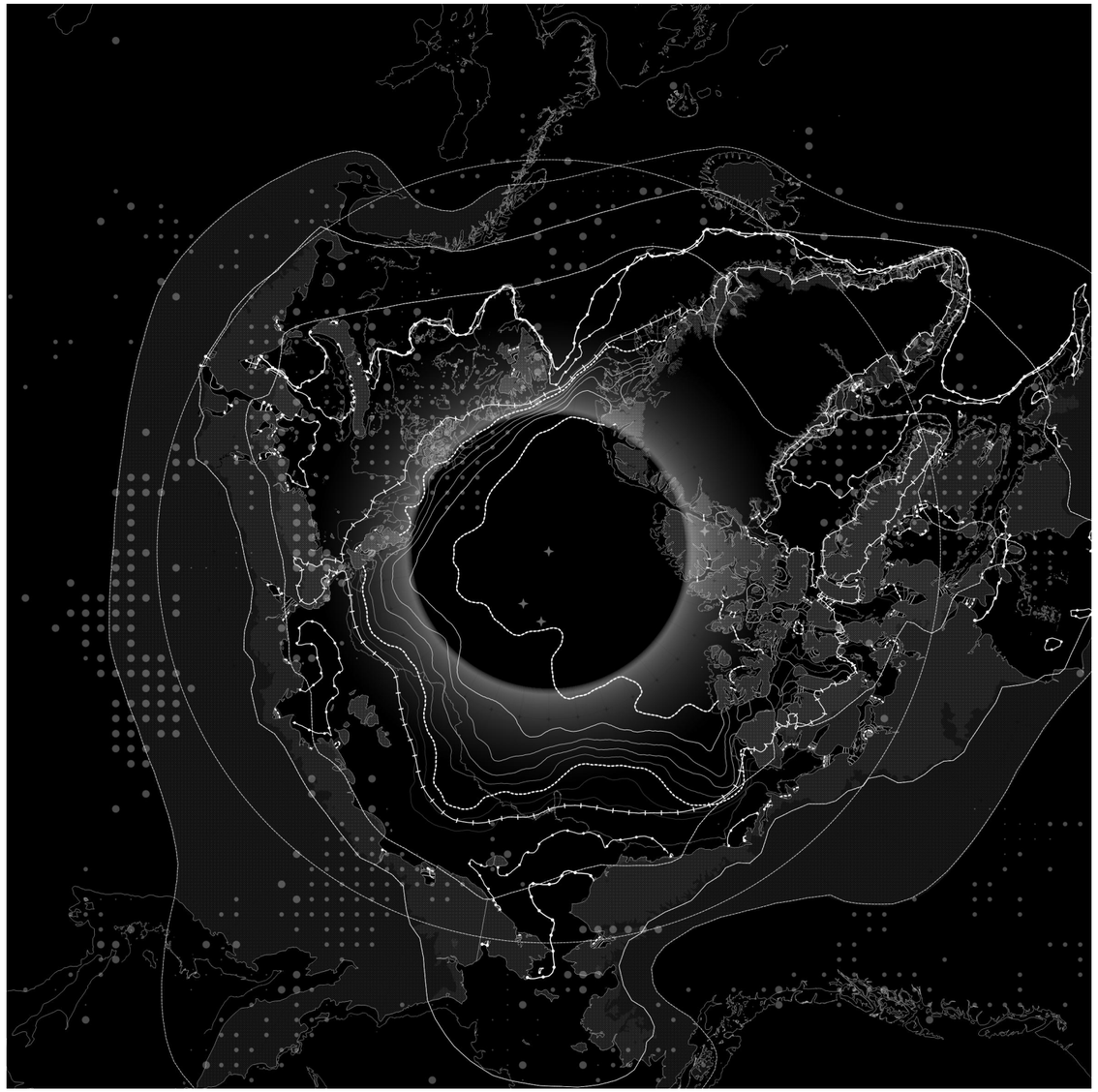


Figure 102. Westphalian territoriality through matter. Instead of being the singular delimitor of the Arctic, at every aspect, it will now have to respond to the biophysical conditions throught the node.





EPSG:3575
1 : 36 000 000

100 x 100km

Source:
C3S (2026)
GeoNorge (2025)

Figure 103. Biophyisical deliminators of the Arctic. From typical cryospheric conditions, to multi-criteria biophysical indexes, celestial extremes and geomorphological thresholds.

Mediating (Non-) Human Migration Routes

The Right of Passage

A critical function to facilitate from the territorial scale is to provide nodes with the spatial power to enact and alter shipping routes in ecologically sensitive and contested areas. It is widely known that cargo ships cause noise disturbances several kilometers away from origin, as sound propagate greatly through water (Findlay et al., 2023; McKenna et al., 2013). Marine species sometimes rely on the magnetic field to navigate, which often goes neglected over our cartesian navigation systems. Therefore, any straits along the shipping routes should have at least one node present, with preferably two as for redundancy and load offsets. Particularly in contested zones, as seen in *figure 104*, must enforce strong retainment strategies to create leeway for non-human seasonal migration with a buffer of at least 10 kilometers when possible (Findlay et al., 2023).

Marine Navigation
Mediating Grounds of Human & Non-human

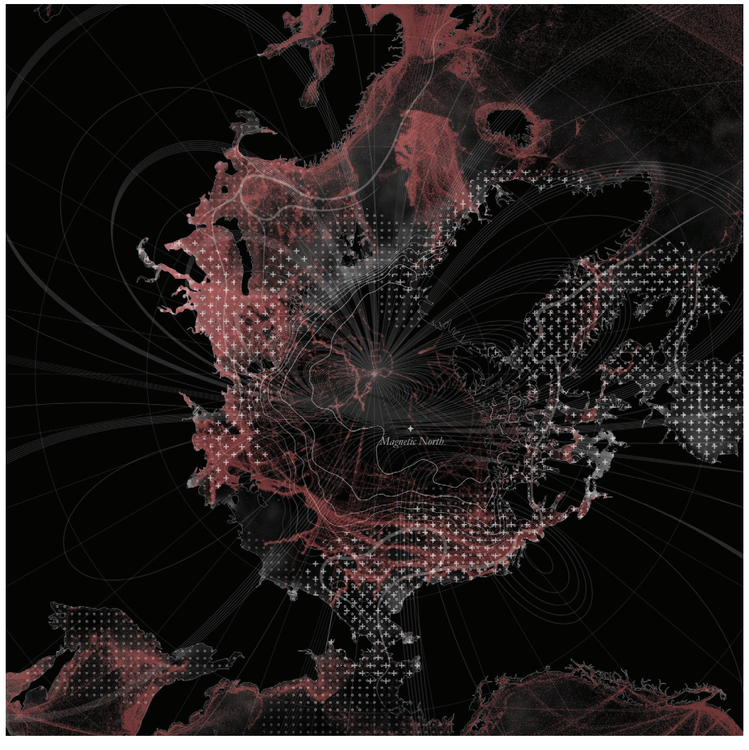


Figure 104. Means of navigation across the Arctic, either magnetic, celestial or cartesian.

An Estimate of Time & Occupancy

Operational Limits

Given how each nodal point must be accessed more than simply once, then its location should be based on the human threshold of commute on top of the biophysical conditions. Similarly to what offshore workers today are operating with, an imagined duration of stay would vary from under a day to over multiple months. If a node have a secondary program of anything service-related, such as being a hotel or museum, then for the nodes to be theoretically operational it must consider a high turnover of inhabitants. An estimate of time, or stay, is inherently an estimate of needs and degree of dependency which the node have to answer to. As seen in *figure 106*, occupancy directly shape the required space for the occupant too. While not the focus of this research, it is important to note that these far offshore platforms will have either a heavily reduced crew or a massively scaled-up platform to sustain the other. The degree of each nodal transformation is however the territorial interest to note.

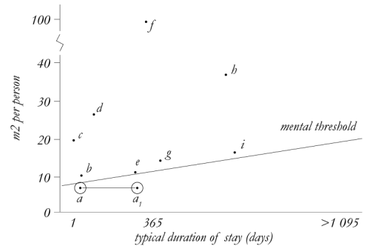


Figure 106. Relation between living space and duration of stay. a: offshore platforms, b: cruise ship cabin, c: short-stay hotel, d: extended-stay hotel, e: college dormitory, f: Concordia Antarctic research station, g: factory housing, h: average European living area, and i: tiny homes (adapted from Ulrich, 2025)

Human Reach
2-hour Commuting Distance by Air & Sea

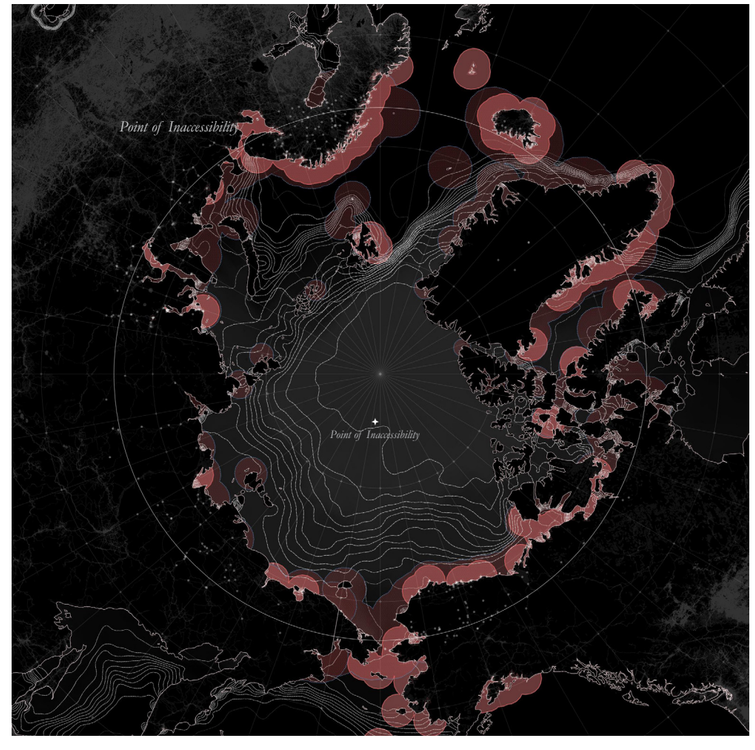


Figure 105. Operational reach of main offshore commuting types for frequent commutes. Areas beyond the marked areas as less accessible and would imply longer periods of occupancy and isolation.

Territorial Assemblage

Envisioned: Northern Sea Route

The Northern Sea Route will gradually emerge despite infrastructural lacking to support fully as of today. Given the significant developments long the North-West Passage, it raise the need for a greater control of incoming vessels on the Atlantic Arctic gate. The Bering Strait will continue to function as a natural bottleneck for traffic from where monitoring and redirection can happen onshore to mediate the strait for non-human passage as well.

In the face of the great cryospheric split and subsequent collapse of coastal zones along the Russian Arctic, nodes are envisioned to leverage the situation through rerouting the NRS. Especially along straits and the open seas will these nodes inhibit vessels from chipping off further and further into the Arctic domain.

This will be ensured by a pre-plotted route from the gate nodes through the transit nodes. For every connection between a node, the shortest path between the two and the following node must never pass the 80th latitude. Redundancy in the system is essential for operation, especially given the how unruly the Arctic seas are.

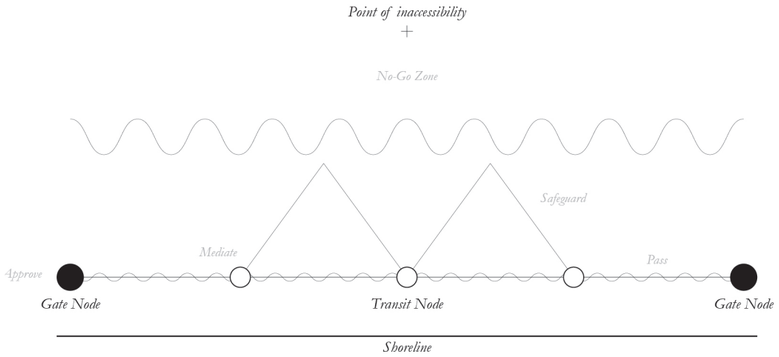
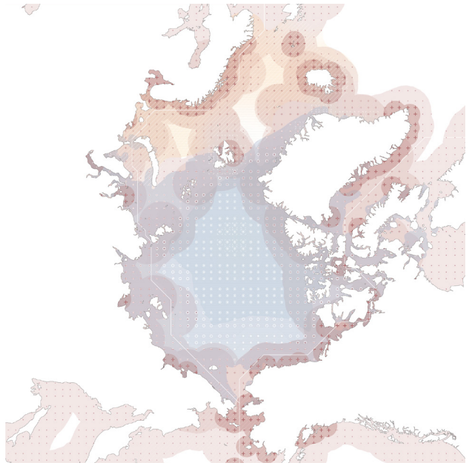


Figure 108. Territorial transit logic, with the two distinct nodal roles and protective agentic field to the inner Arctic.

Programmatic Zones
Territorial Roles & Relative Access



Service-related Programming, Frequent Commuting

Shipping-related Programming, Semi-Frequent Commuting

Research-related Programming, Infrequent Commuting

Fishing-related Programming, Infrequent Commuting

No presence

500 km
EPSG:3575

Desired NRS Latitude Limit

Area of Nodal Reconfiguration

Area of Nodal Decommission

Area of Nodal Establishment

Point of Mediation

Ecological Right of Passage

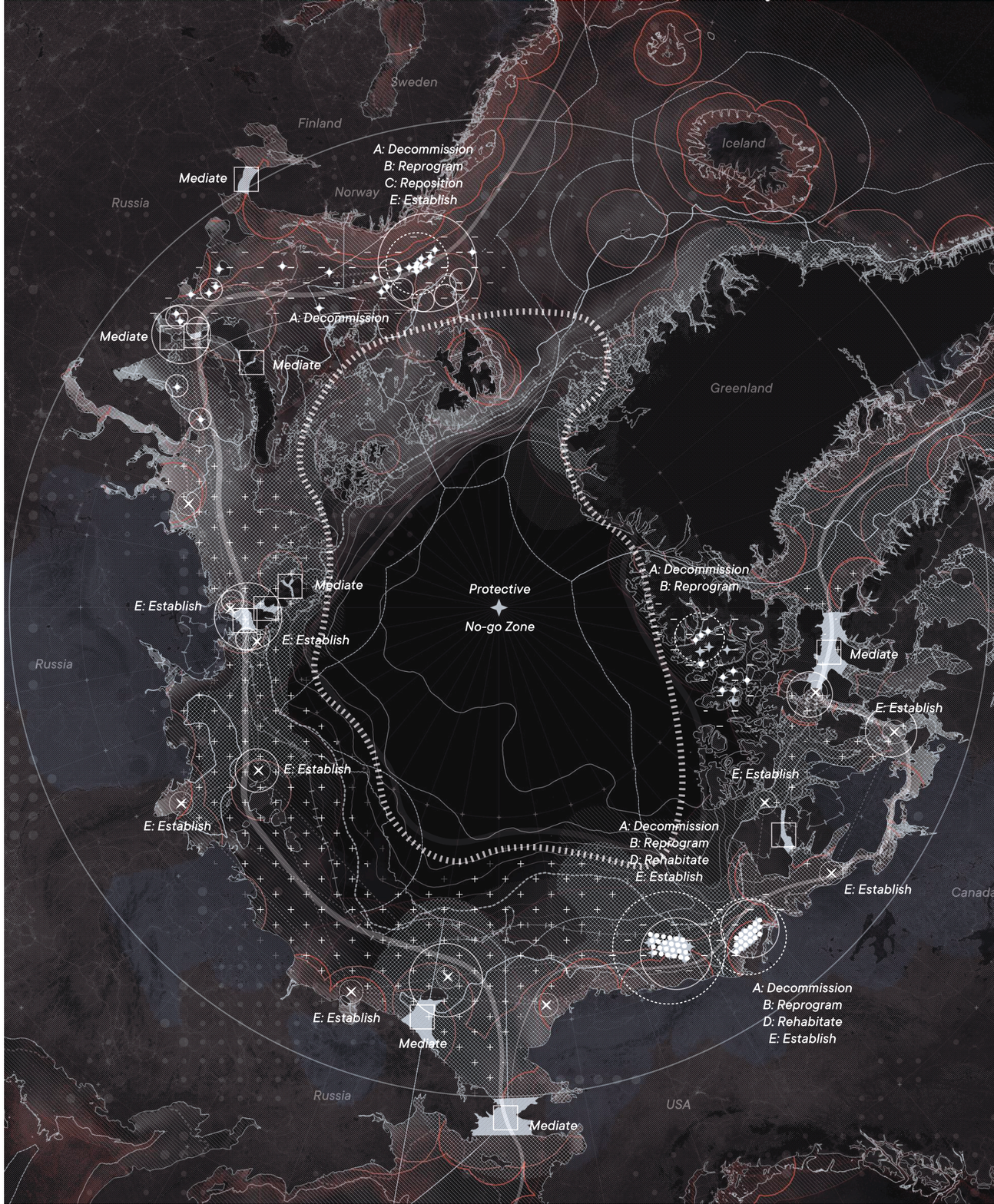
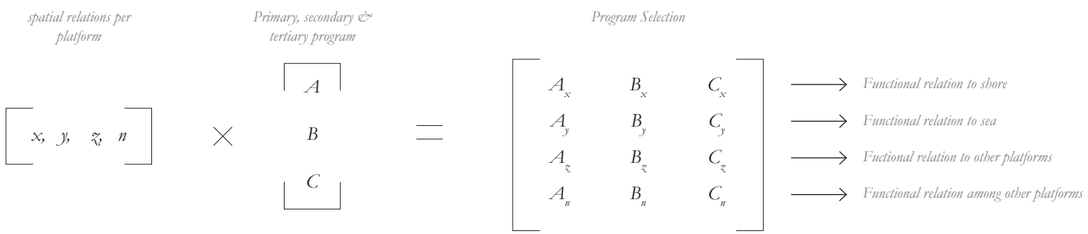


Figure 107. Mediated Northern Sea Route through a nodal-based and biophysically-responsive territorial border.

EPSG:3575
1 : 60 000 000



Nodal Logic

Nodal Typologies

The nodal logic derive from the territorial, that being each node should directly be informed by the environment program wise. Any node can be simplified into having four spatial components or relations:

1. The relation to shore
2. The relation to ground
3. The relation to other platforms
4. The number of platforms in its vicinity

From here one can generate a rough outline for what programs would be best suited beyond the territorial role of the node. Each will still need be to tailored to the situated context, but can provide the initial stepping stone to start a conversation of what is best suitable. This is again a conversation best done between national, international, indigenous and non-human representatives, and not one stakeholder group alone.

Generally the nodes can be placed into a few distinct sub-roles: observative, service, or productive. Larger clustering of nodes will be able to provide for more non-essential services for self-sufficiency. Such constellations are already prevalent in certain areas and can be well utilized by applying the different strategic actions listed in *table 2*.

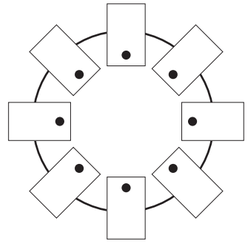


Figure 110. The three scales of the project: the circumpolar (1), the marine-terrestrial eco-nomical transect (2), and the platforms (3).

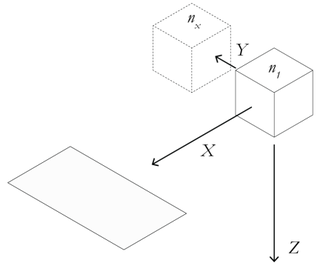


Figure 109. The logic revolve around the premise of the platforms (2) being informed by its environment (1) before taking a part in its circumpolar context (3). Not fully top-down, neither directly bottoms up. Instead the platforms themselves become a mediation in construction as well as operation later.

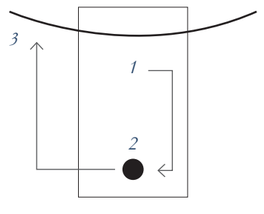


Figure 111. The logic revolve around the premise of the platforms (2) being informed by its environment (1) before taking a part in its circumpolar context (3). Not fully top-down, neither directly bottoms up. Instead the platforms themselves become a mediation in construction as well as operation later.

Table 2: Typological overview of nodal strategic intervention and programming. Classified further in relation to different matters of territorialization,

	Condition	nr.	Decommission	Reposition	Reoccupation	Reprogram	Establishment
X Distance to shore	*< 12 nautical miles*	I		O		-	
	12 - 24 nautical miles	II		O		-	O
	> 24 nautical miles	III		O		-	O
Y Distance to other platforms	*< 10 km*	IV		O		-	
	10 - 20 km	V			O	-	
	> 20 km	VI	O		O	-	O
Z Distance to seabed	*< 100 m*	VII	O			-	
	100 - 300 m	VII				-	O
	> 300 m	IX		O		-	O
n Units in agglomeration	*< 2*	X		O		-	
	2 - 10	XI	O		O	-	
	> 10	XII	O		O	-	O

Typologies
Context

Deterritorialization
Recycle Old Platforms

Reterritorialization
Foundational Shift

Stratification
Presence

Coding
Function

Territorialization
New Platforms

	Class I	Class II	Class III
Distance to Land (X)	*<12 nautical miles*	*24 nautical miles*	*>200 nautical miles*
Distance to Seabed (Z)	*<100 meters*	*200 meters*	*>1 000 meters*
Proximity to other platforms (Y)	*<10 km*	*20 km*	*>50 km*
Clustering Size (n)	*<2*	*5*	*>20*

Marine Shipping Mediators
Primary Function

+

Situated Programming
Secondary Function

	Observative		*Service*		*Productive*	
	Search & Rescue	Monitoring	Tourism	Educational	Energy	Aquaculture
I	O	O	OOO	OOO	OOO	OO
II	OO	OO	OO	OO	OO	OO
III	OOO	OOO	OO	OOO	O	OO

Nodal Typologies

x - The Extended Borderscapes

It has been clear that the relation the node has to the shoreline will determine its programming and frequency of stay. Another crucial aspect to be aware of is the potential dangers in remoteness of said nodes. They will be connected to the mainland to some degree, and it is important that close-shore problems are not only extended further out. Rather, it is of great concern to not make the nodes an excuse of neglect of certain economical aspects.

As seen in *figure 112 & 113*, certain destructive loops can be perpetuated by a misuse of the nodes. Therefore it is of upmost concern to manage the platforms with more than national player. It must resonate in the territorial governance of the Arctic as a more-than-Westphalian model, given the global interest in a sustained Arctic existence.

The future of several nodes will regardless be the legacy of current extractivism, and so the systems who built them in the first place are important so phase out rather than relocate. That however will require more than what the proposition can deliver on. What can be stated however is that extractive industries cannot exist beyond the nodal border.

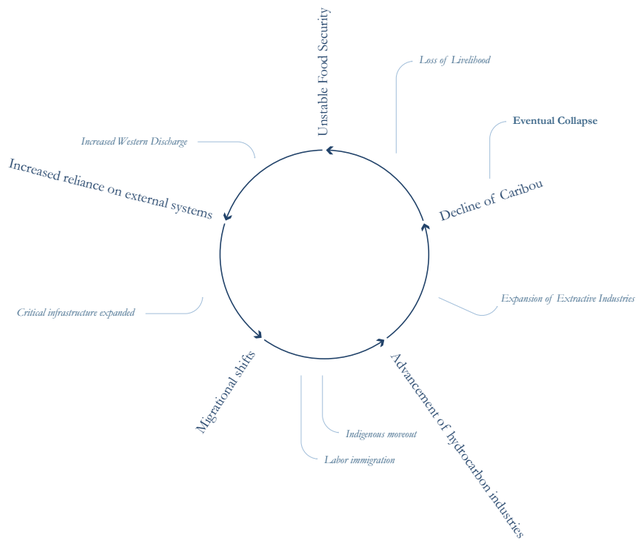


Figure 112. Destructive cycle for the Gwitch'in indigenous population in Alaska, USA.

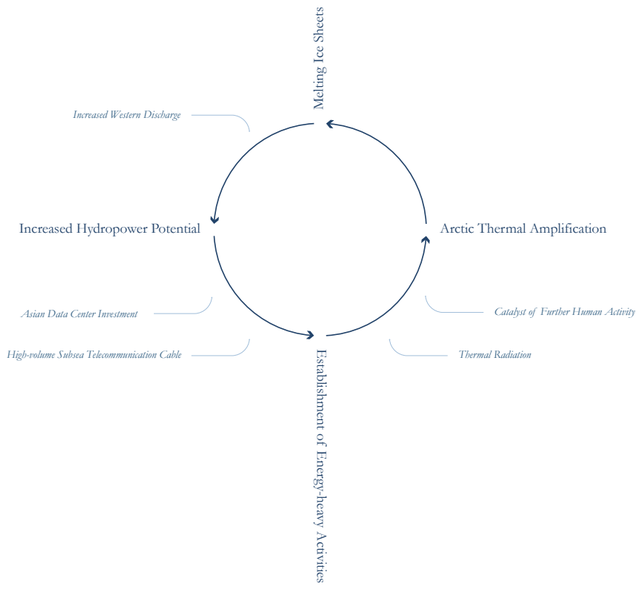


Figure 113. Destructive cycle of infrastructural developments in Greenland.

Near-land Border

Prudhoe Bay, USA

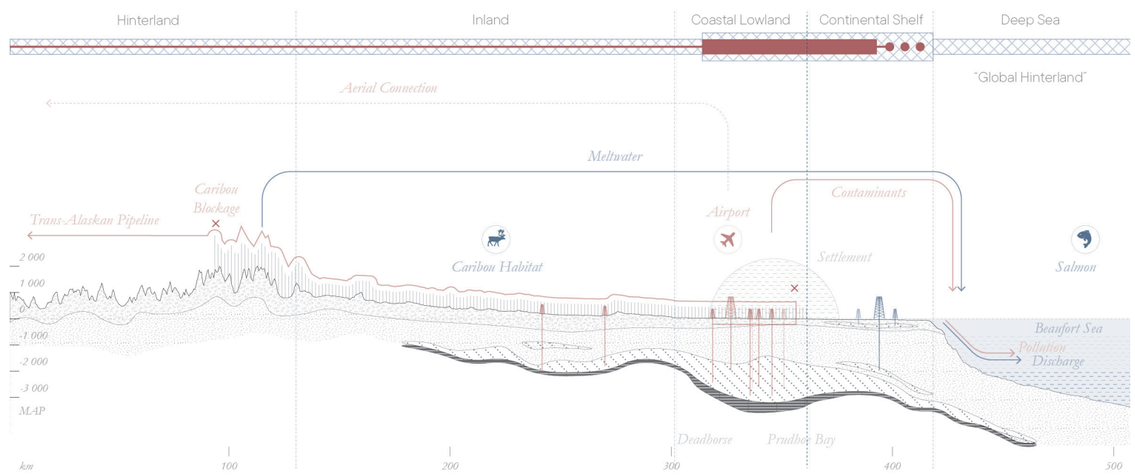


Figure 114. Relations between ecology and economy in Prudhoe Bay, Alaska.

Extended Border

Murmansk, Russia

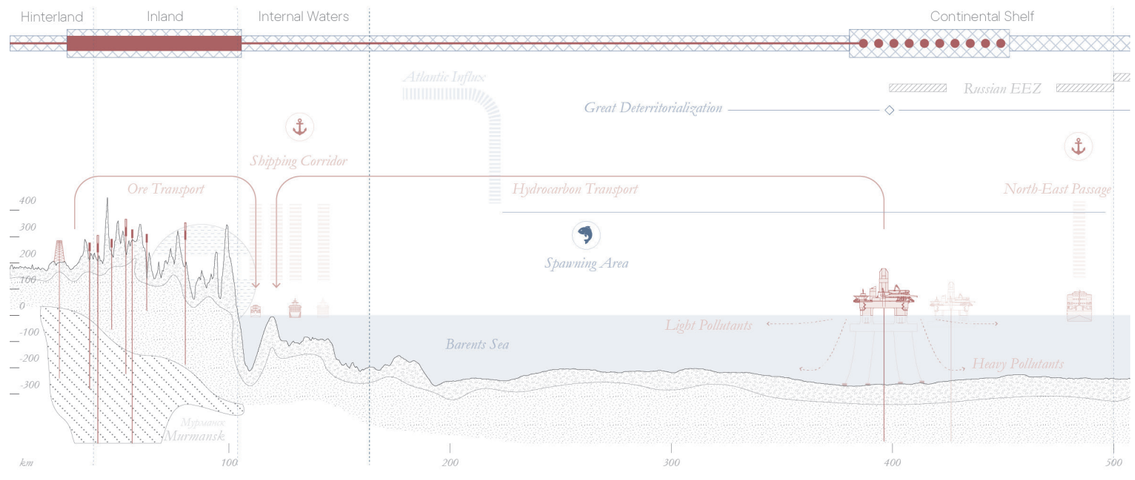


Figure 115. Relations between ecology and economy in Murmansk, Russia.

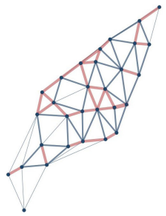


Figure 116. Overview of offshore clusterings within the typological limits.

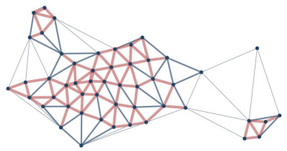
Nodal Typologies

y,z,n - The Ocean as Bearing Ground

A core principle in the proposition is to treat the ocean ground indifferently from terrestrial ground, both legally and to the best extent practically. Every node can be the equivalent of a small neighborhood, with constellations such as the one in Prudhoe Bay to come close to a small town. While humans will operate on the surface level and connect with similar nodes in a dynamic web, it must be underlined that such configurations are equally vertical in the maritime realm. Depth directly shape the foundations of historical platforms, and so any retrofit must either accept what stands or partake in drastic alterations to release itself and its vertical dominance from the seabed.



I.I.III
A. Mackenzie Valley
Shallow-water, semi-dense clustering



II.III.III
B. Prudhoe Bay
Deep-water, dense clustering



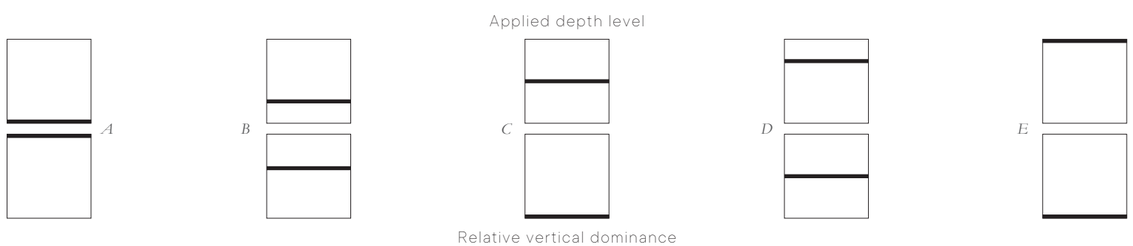
III.III.II
C. Wisting-Snøhvit-Castberg Field
Continental depth, sparse clustering



II.I.I
D. Prirazlomnaya Field
Continental depth, minimal clustering



Figure 117. Offshore foundations depending on depth.



Calibrating

Design Outline

The design will directly answer the aspects established in the frameworks, respond to the analytical findings and relate to the nodal border proposition. From this, a set of key principles arise:

a. The demarcation of the Arctic territory will be bioregionally-based, ultimately resulting in non-fixed borders.

b. The dynamic borderscape span across both land and water, which require connecting onshore and offshore (eco) nomies for recognized mediation.

c. The mediation happen along nodes, which will be a reprogramming and realignment of existing and future offshore platforms.

d. The nodes are made with human and non-human occupation and passage in mind, and is in constant dialogue with the biophysical borderscape by seasonal repositioning.

Due to the selected scope and lens on the territorial scale rather than the architectural, the design will emphasize on the structuring and constellation of platforms over the platforms themselves. Regardless, each constellation or individual node will be given suggestions to programming, both of primary and secondary functions. The technical realization and specific layering of programs within each node are however out of this research scope.

There are three aspects to consider for each nodal design and configuration:

a. The biophysical delimitation in which the node reside in

b. The operational extent from which the node is located from

c. The territorial role and function which the node must serve from a human and non-human perspective

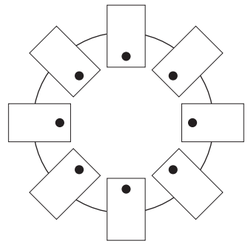


Figure 118. The three scales of the project: the circumpolar (1), the marine-terrestrial eco-nomical transect (2), and the platforms (3).

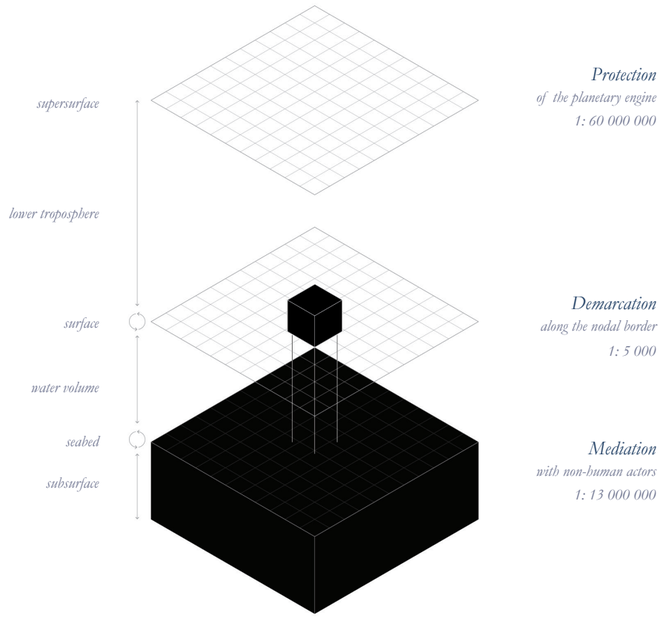


Figure 119. The three vertical layers of design: subsurface, surface and supersurface. Each with a distinct sub-vision.

Design Response to Conceptual Topic

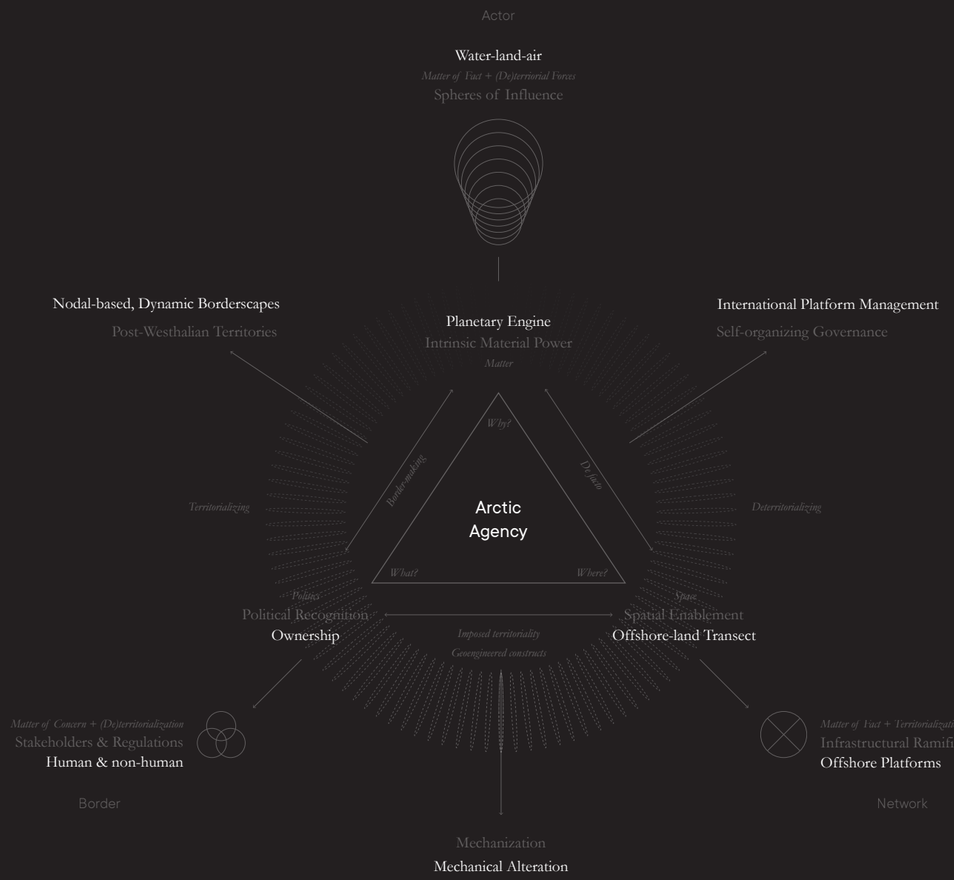
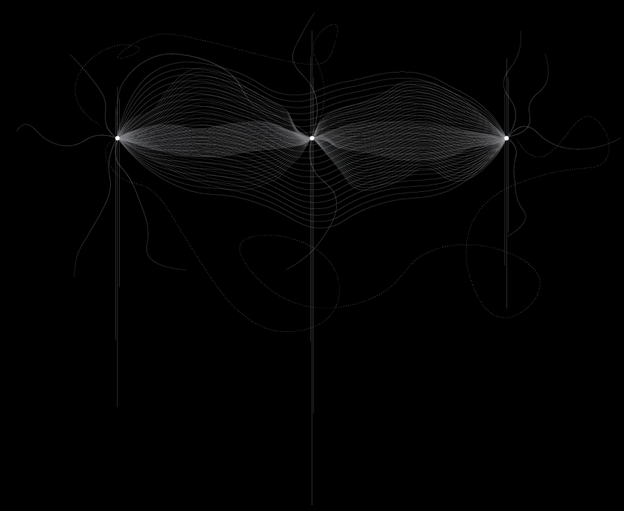


Figure 120. Design response to the conceptual framework. Each essential point for Arctic agency is addressed directly through the

Transit Field

Design of The Northern Sea Route

gate
through
dynamic
throughout
transit



A point is always a point of origin. But a line of becoming has neither beginning nor end, departure nor arrival, origin nor destination; to speak of the absence of an origin, to make the absence of an origin the origin, is a bad play on words. A line of becoming has only a middle. The middle is not an average; it is fast motion, it is the absolute speed of movement. [...]
A becoming is neither one nor two, nor the relation of the two; it is the in-between, the border or line of flight or descent running perpendicular to both. If becoming is a block (a line-block), it is because it constitutes a zone of proximity and indiscernibility, a no-man's-land, a nonlocalizable relation sweeping up the two distant or contiguous points, carrying one into the proximity of the other—and the border-proximity is indifferent to both contiguity and to distance.

Gilles Deleuze & Félix Guattari,
A Thousand Plateaus (1987)

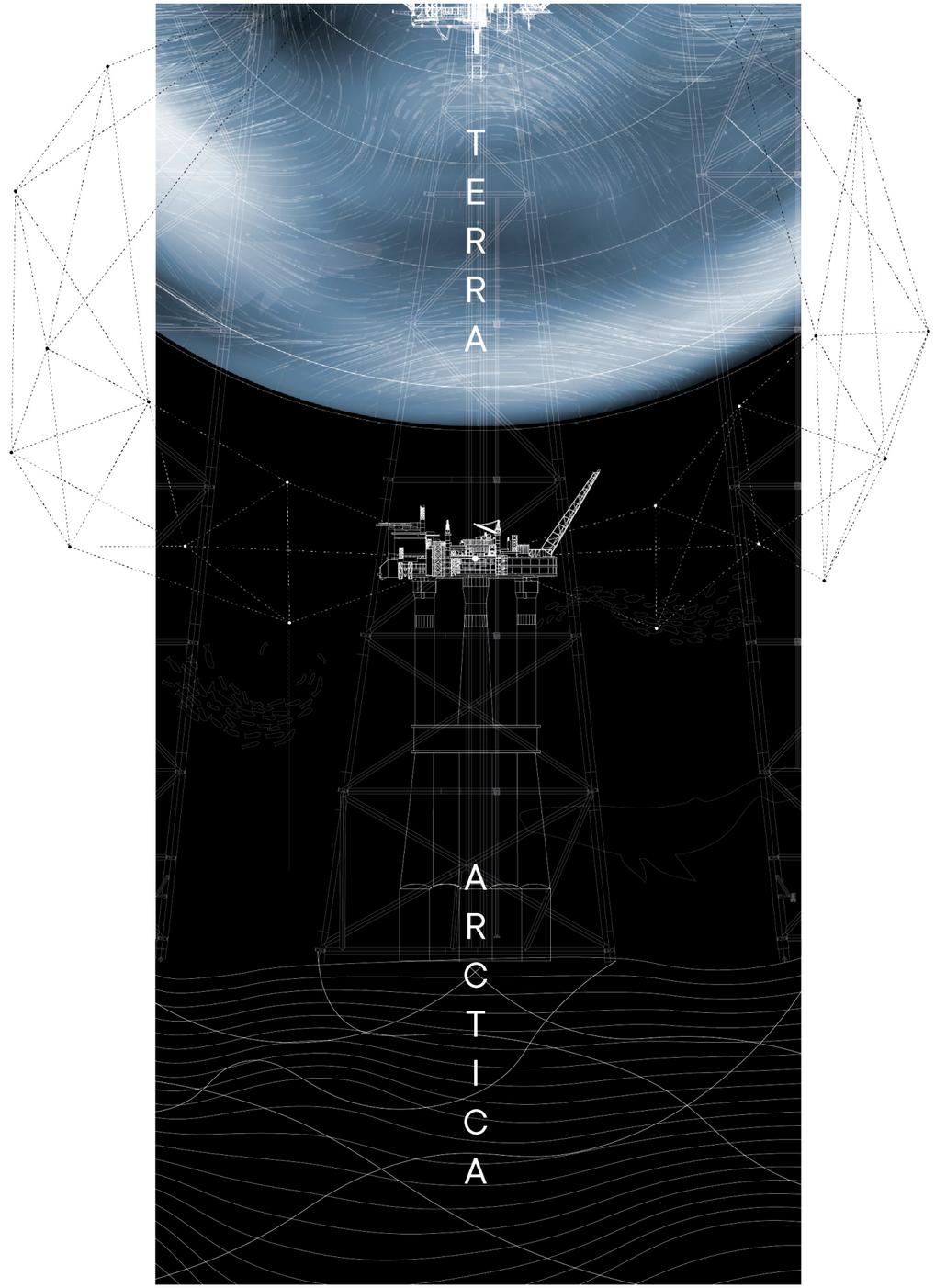
Envisioning

Terra Arctica

The sea will not be a subjugate to land. It will be treated as if it were land through our terrestrially biased lens. It will be a territory on its own terms, and how it is demarcated by the West-Phalian system will follow. The urbanization of the sea is not seen as a threat or an offensive and imposing force for the maritime, instead it becomes the tool for mediation against ourselves. The seas will be the high Arctic ground, it will be the new Terra Arctica. A place where the Arctic is being monitored equally to mankind.

Offshore platforms, once the literal pedestal of state-of-the-art extractivism, will become outposts for the Arctic itself. Engineering marvels reprogrammed; terrestrial frontierism to marine control nodes. When the Arctic reluctantly recede, we will follow by ship. Ships that the platforms keep in check before the ever arrive. To steer them away from the inner Arctic and keep distance to the delicate core components of the planet's cooling mechanisms. The interest of each captain or cargo owner and consumer, will not be on the planetary scale. Instead, the path in which the platforms carve, and the reduced shipping distance that the Arctic regions offer will be. How can the Arctic be given agency? By steering anthropogenic marine activity. Inhabit the Arctic, the seas, in its own terms. The platforms as nodes demark the border, but ultimately it is the Arctic who determine their place.

Their location is never fixed nor static in form and state, like its host. Together, the assemblage of every local nodal clustering make up a reactive border. One which traditionally would not operate within the constructed legal system, globalized in the 20th-century. It oppose it, yet does not require to exist without it. Every platform, an opportunity to manage nationally or internationally if desired. For on international water, anything which isn't extracting resources or fixed in place, are given rights of passage. Alternatively, it is a right of temporary presence.



Design Overview

Alterations

Deriving from the territorial logic and nodal conditions, the nodes can generally be categorized into three distinct alteration:

1. Decommission, or reduction
2. Transformation, or alteration
3. Establishment, or addition

From there the node is altered to the desired state that the larger environment and territory require. Following the chart on the right provide an overview over how similar every alteration in reality is, with the major differentiation being the greater territorial role to represent. Each platform is, to the best extent possible, expected to be self-reliant. Particularly for deep-sea platforms which often reside far away from any logistical hub. To support for instance local food production, a platform could attach an additional supplementary node to it, like a small aquacultural farm or an energy generator. The key takeaway is that the proposition deliver a set of rules to apply to all platforms, which in return set the stage for a highly moldable offshore constellation. Particularly with the desire to make every new platform dynamic by nature.

A significant alteration throughout each platform is the increase in personal space. By today's standard, most platforms will see a decrease in crew capacity by 60-75% unless additional structure is built. For a normal processing platform, this would reduce the 'population' from 80-100 to around 30.

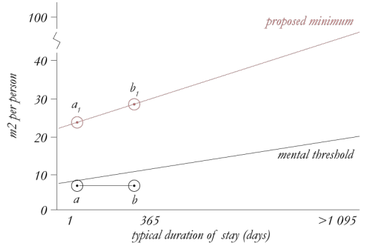


Figure 125. Proposed minimum compartment limit againt current builts of platforms, a & b (based on figure 106).

Territorial Role

Platform Typology

(Eco)nomically-Informed Trajectory

Operational Program

Gate Node



Figure 123. Gate node

Transit Node

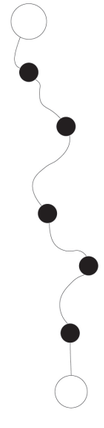


Figure 124. Transit node

Shallow Platform

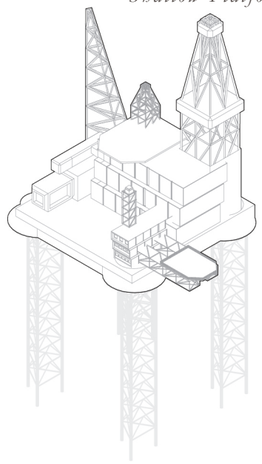


Figure 122. Fixed platform

Deep-Sea Platform

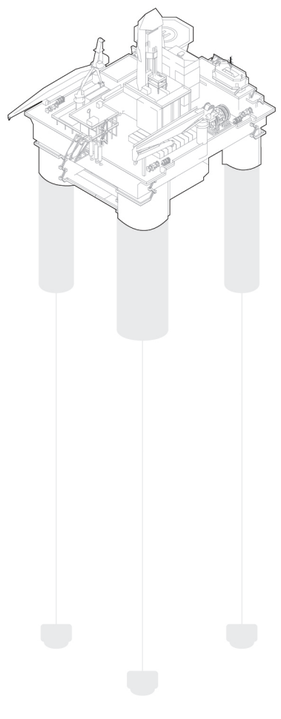


Figure 121. Semi-fixed platform

possible foundational transformation

removal of intruding platforms beyond the transit field

removal of contaminating components

foundational transformation to be detached from seabed

Decommission

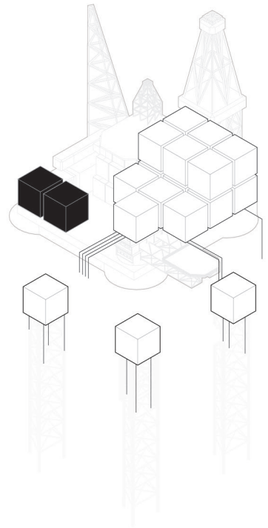


Figure 129. Recycled platform

Transform

Redesign developmental models

Establish

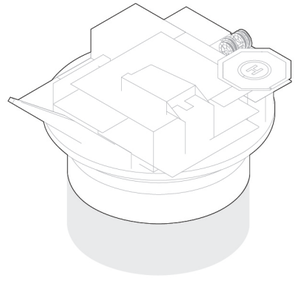


Figure 130. Floating platform

Material Reuse

Long-term Stay

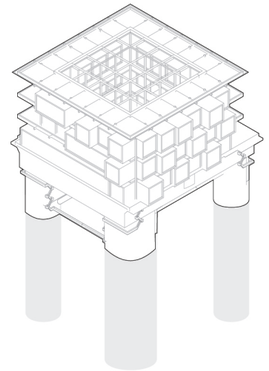


Figure 126. Occupationally-oriented platform

Short-term Stay

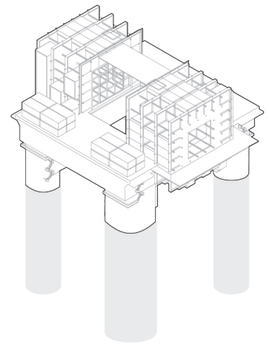


Figure 127. Logistically-oriented platform

Material Reuse

Supportive Add-ons

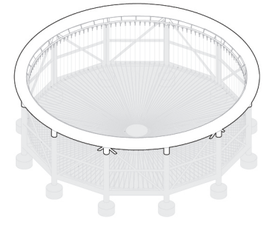


Figure 128. Aquacultural structure

Internal food, water & energy production

DESIGN I: GATE NODE

Barents Sea

Snøhvit Oil Field

The gate node will be the main entry point across the Northern Sea Route. As so, one can expect a greater load to be met before the traffic disperse across the route. The Snøhvit Field off the Norwegian coast is already positioned in relative proximity to current shipping routes and with a clustering size significant enough to facilitate multiple program-specific nodes. This is why Snøhvit was selected to establish a gate node.

The environmental conditions around the gate node are already severely affected by global warming, as with the rest of the Barents Sea. Because of the recession in ice during high winter, an unrestricted extension-based structure has managed to emerge with projected growths to further intrude into the north (Equinor, n.d). As a response to this in the open-sea environment, a proposed containment structure is tested out. Its aim is to delimit a zone from the platforms which within economical activities can happen. This is notably only half of the EEZ extent and ultimately the widest point of the proposed containment zone.



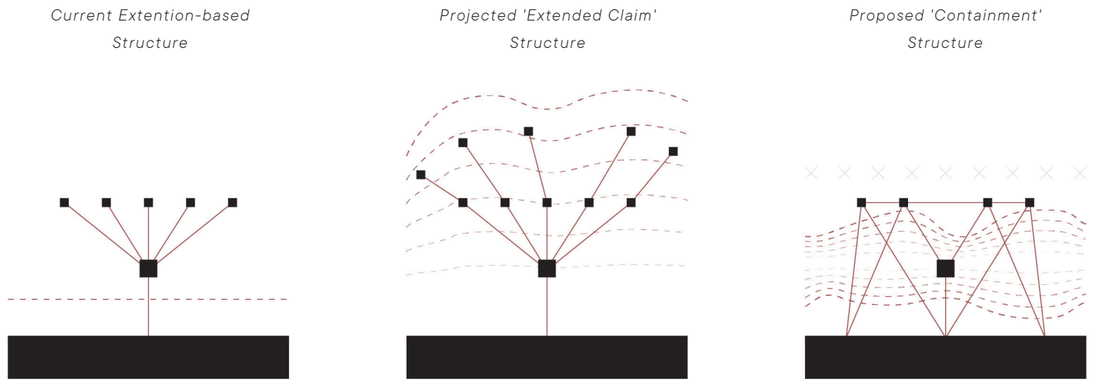


Figure 131. Developmental logics of extractive offshore infrastructure in the Snøhvit field, the projected future and the proposed alteration shift. Red lines indicate path of motion, eg. marine shipping routes or platform-to-shore connections.



Figure 132. Biophysical and operational conditions of the Barents- and Kara Sea along the North-west Passage, along with proposed nodal placements.

To Murmansk
Мурманск

Shtokman field (pending)
Gazprom [RUS]

Russian EEZ

Norwegian EEZ

Mainland Commute
bimonthly-weekly, by helicopter

Floating Platform
non-fixed structure

Wisting
Equinor [NOR]

Intensive fishing
on continental shelf

Icebreaking
for shorter routes

Snøhvit
Equinor [NOR]

platform-to-platform transport

Anchored Platform
semi-fixed structure

Russia

Norway

Finland

Kirkenes
local hub

Nikel / Никель
historical mining site

Båtsfjord
airstrip

Mehamn
local port-side

Hammerfest
local hub

Melkøya
processing facility

Alta
regional hub

Longer Flights
to national hubs

Saami Livelihoods
Reindeer economy

To Kiruna
mining site

Main Transport Routes
Terrestrial flow of goods

Tromsø
regional hub

Longer Flights
to national hubs

Gate Node: Barents Sea

Current 'Extended Claim' Configuration

Northern Sea Route
Mediated path

To Murmansk
Мурманск

Russia

Norway

Finland

Kirkenes
local hub

Nikel / Никель
historical mining site

Northbound Ecology
boreal shift

Reindeer economy

Saami Livelihoods
Reindeer economy

To Kiruna
mining site

Båtsfjord
airship

Hammerfest
local hub

Alta
regional hub

Main Transport Routes
Terrestrial flow of goods

Tromsø
regional hub

Longer Flights
to national hubs

Longer Flights
to national hubs

Mehamn
local port node

No-go Zone

Russian EEZ

Norwegian EEZ

Tourism Connection
Cruise Ships

GATE NODE
Semi-fixed Offshore Complex
Leisure, logistics & tourism

No-go Zone

Control Point
Goods, fuel & other

Platform-platform Transport
Helicopter

Aquaculture
nodal food source

Transit Node
Floating Offshore Checkpoint
mediating shipping traffic

Platform-platform Transport
Boat

No-go Zone

No-go Zone

receeding ice

Gate Constellation: Barents Sea

Future 'Containment' Configuration

Gate Node: Snøhvit-field, Barents Sea

G1: For Tomorrow, Hold On

(Super)Surface



Figure 133. Intra-mobility

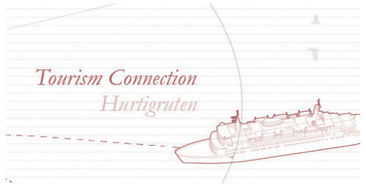


Figure 134. Terrestrial economical connection

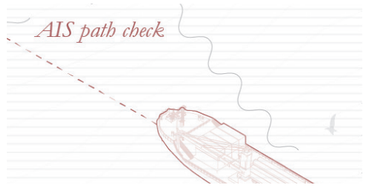


Figure 135. Territorial role

(Sub)Surface

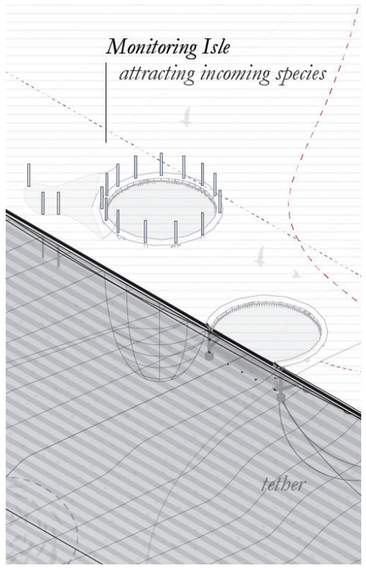


Figure 136. Non-human migrational monitoring

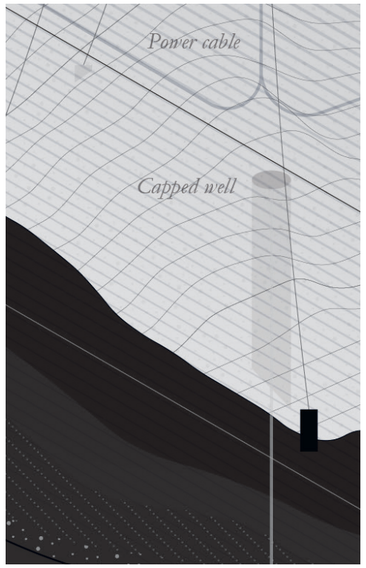


Figure 137. Out-phasing of extractive function

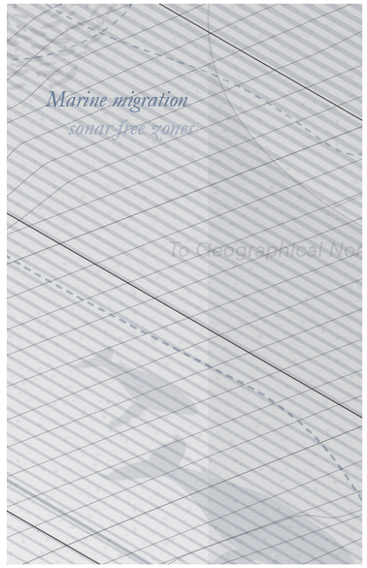


Figure 138. Sound and light consideration for non-human mobility

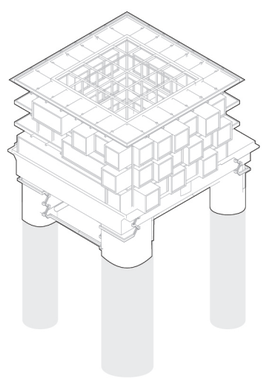


Figure 139. Occupationally-oriented platform

The nodal border construct must inherently be dynamic, like its foundation, the sea. However, that does not call for every platform to be dynamic too. Existing structures, such as the Snøhvit field in the Barents sea, will be detrimental first steps towards the border creation. A stepping stone from where more fluid structures and managerial structures can emerge.

Given the highly active coastal conditions of the site, pre-existing platforms can be given a high degree of programmatic variation and service outputs. For instance, both the focal interest group of cargo ships, as well as secondary shipping activities such as fishing and commercial, can all be integrated with the nodal constellation. Hurtigruten, a popular tourist shipping line, can be utilized to create an offshore tourism economy, while providing any supplies or crew. While details of such symbiotic relations are needed to see the feasibility, the platforms will nonetheless be capable of proposing them.

Importantly, the locally rigid territorial structure enable clear ways of passage for humans and non-humans. The latter now less disturbed by overall human activity spread out in critical migration zones.

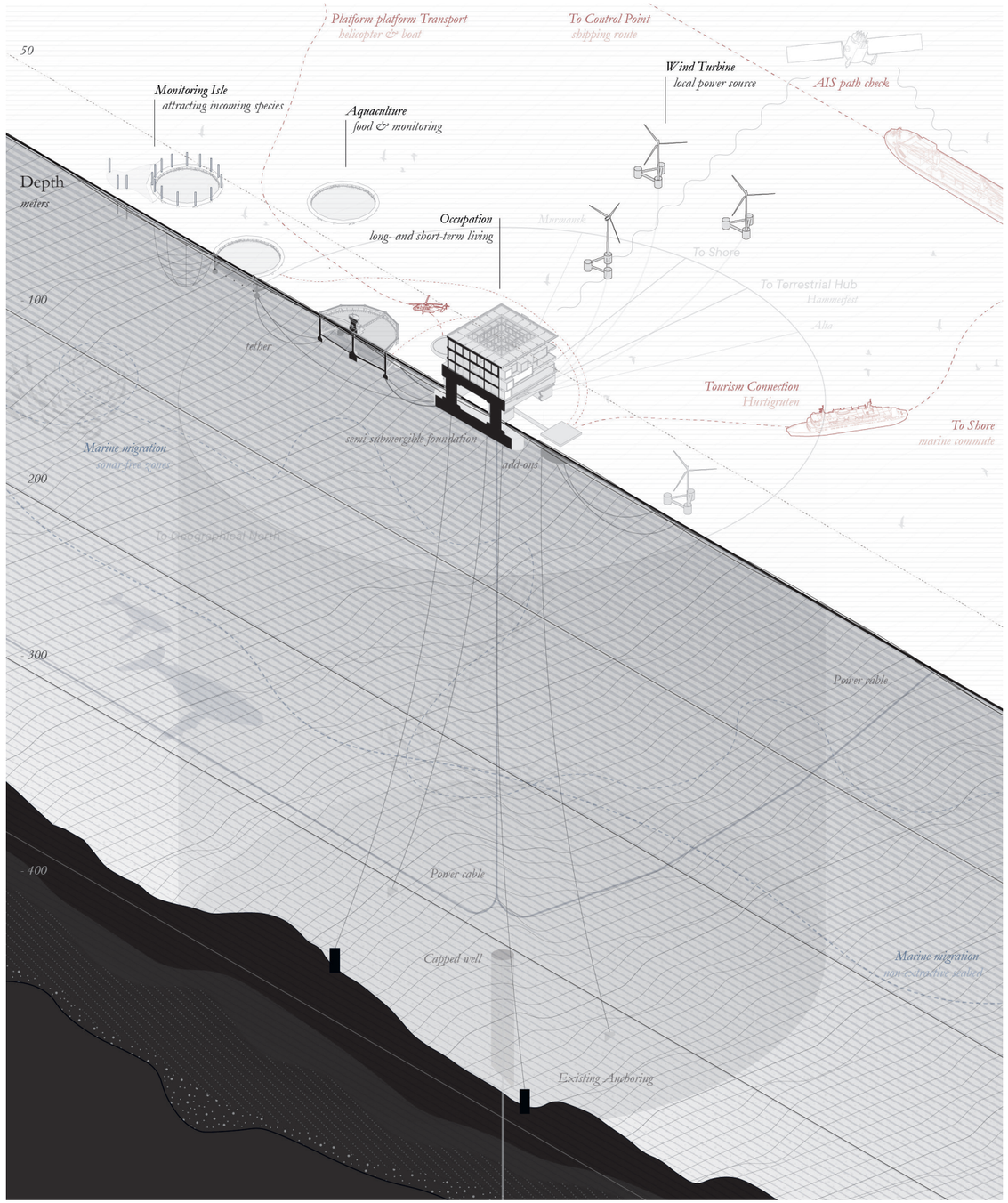


Figure 140. Section of an reprogrammed and altered Snøhvit oil platform, wirh its relations to its environment across matter. Larger social and environmental conditions are utilized to create a post-extractive scenario for the platform. Dependencies to the mainland are expected due to the shoral distance and (eco)nomical conditions.

Snøhvit-field, Barents Sea

Ecological Customs Office

The core function and main operational purpose of the gate node is to prepare any vessel for travelling through the Arctic. Checking the type of fuel, plotting out routes and ensuring that the ship can handle the environmental conditions. The gate nodes, or rather constellation given the clustering, will always have at least one control point or more depending on annual traffic quantities.

While the primary role is to ensure a minimized environmental impact per passage on the Arctic, a secondary function could equally be as an overall border-check for either transport of illegal matter or potential dumping in ecologically sensitive areas. Because of this, any logistical platform node would require greater space for efficient checking and any necessary loadings or unloading of cargo.

The transformation of current platforms for such purposed would require substantial alterations. While on one side it would bring great technical challenges, another side could potentially bridge the epistemology of an extractive offshore infrastructure to that of a post-extraction state.

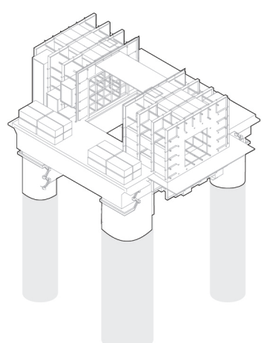


Figure 141. Logistically-oriented platform

Figure 142. Perspective of a speculative offshore logistical hub with the listed necessities. Drawing inspiration from both existing harbors, offshore structures and a modular bulding principle, the following image was created. Regardless of the architectural dimension, the platform would require a significant labor demand. As with the existing offshore projects, this too would be of national interest to implement stable job markets in the high north.

Snøhvit-field, Barents Sea

Northbound Fisheries

A situated economical quality of the future Barents Sea are the shifting fish habitats. As seen in the biophysical deterritorial analysis, the Barents Sea is experiencing one of the most extreme scales of global warming. Instead of limiting the access to regenerative marine resources, the platforms can be used to both cultivate own populations and reach wild ones. By doing so, proposed structures can gain legitimacy, if not political then de-facto, for northern fishing activities.

Close-shore aquacultural developments are already rampant along the Norwegian coastline with challenges of their own. To balance chemical treatments, light- and sound pollution, as well as the overall ecosystem impacts, are aspects to consider for the aquacultural extent per node. Importantly, these structures are a measure which is suitable in the Barents Sea due to the lack of seasonal ice. While possible to implement further north, greater technical challenges as well as the remoteness factor would likely nullify any positive effects generated.

While the projection might indicate a heavily mechanized seascape, smaller elements to support local fauna would exist in-between. Artificial islands, or end-of-life repurpose of aquacultural structures, could support the shifting ecosystem and ensure we are aware of the rate it is happening by.

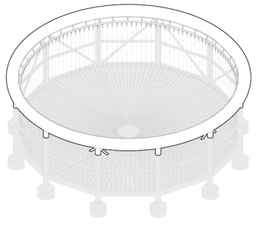


Figure 143. Deep-sea Aquacultural Structure

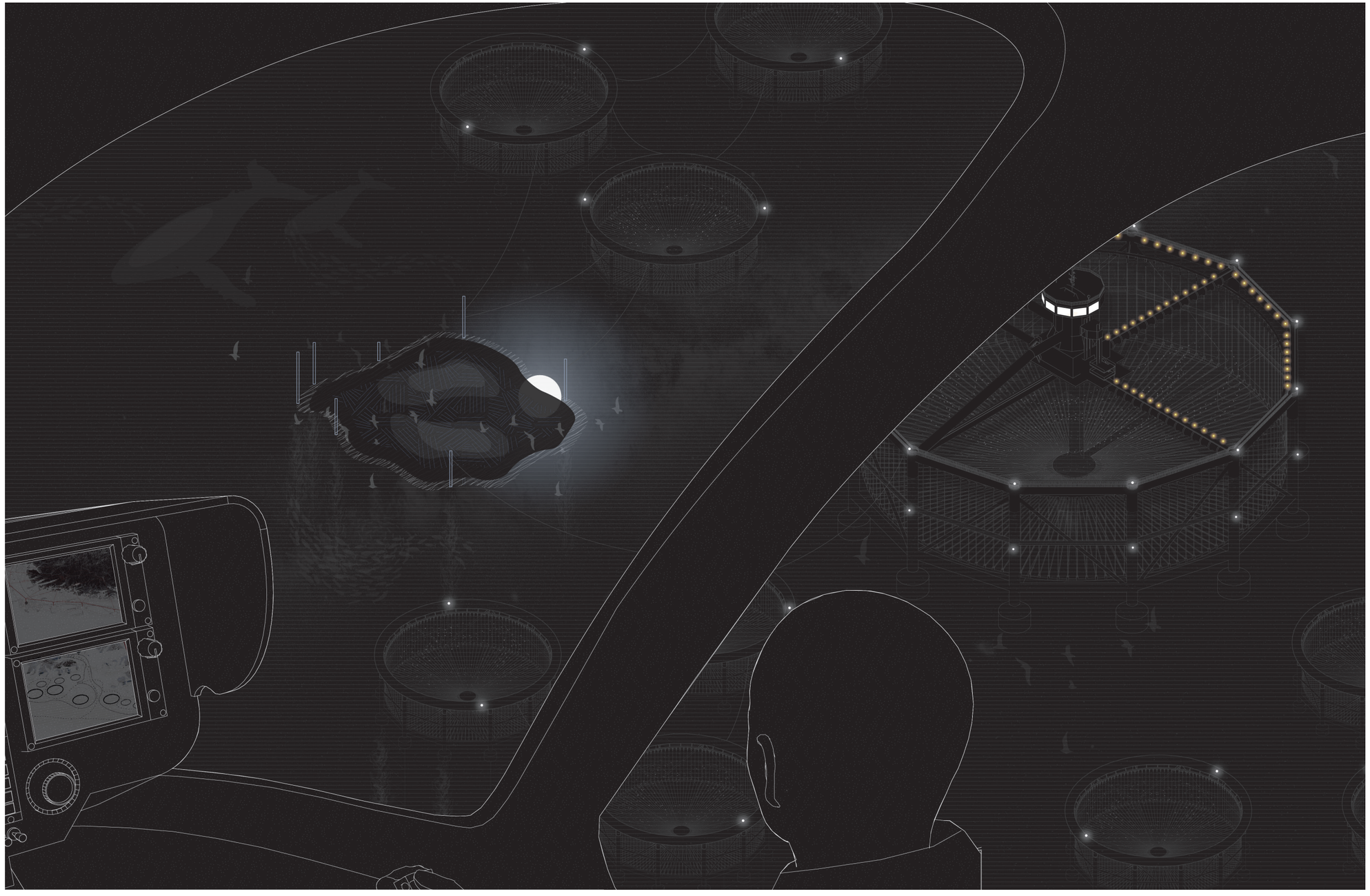


Figure 144. Perspective of a speculative offshore production site, either supplementing immediate shoreline or a platform constellation. Through organized offshore fishing, the platform generate legitimacy as a branch out to marine resources. This enable the owners of the platform to possess a certain degree of power over the immediate area. For one, on the economical aspect. On the other, the ecological, by tracking and monitoring what the site attracts.

DESIGN II: TRANSIT NODE

Barents Sea - Kara Sea

Kara Strait

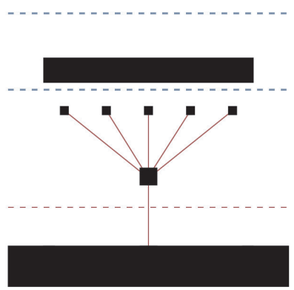
A transit node's primary purpose is to ensure proper passage of both human and non-human beings. Straits are critical areas to intervene in to properly mediate between the two. For that, the Kara Strait is chosen, on top of its significance as a crucial route-determinator.

Current onshore and offshore developments have intensified in the last decades, and the semi-enclosed form of the Kara Sea to Novaya Zemlya make it susceptible to engulfment by these extending, extractive developments. Translating the large constellational vision to here, it is evident that certain platform constellations are cut down, while a few are added on each side of the strait for tight restraint measures. Given the straits importance as an ecological corridor, a dual-flow retainment strategy is proposed. Unlike the Barents Sea, which faced the open ocean, the Kara Strait must manage to set distance between the offshore developments and the opposing landmass, Novaya Zemlya.

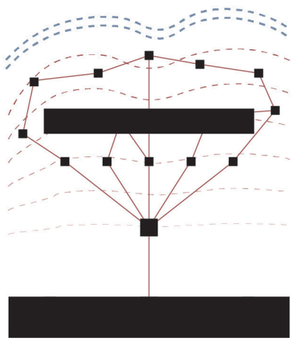
Instead of directing the shipping over Novaya Zemlya, it is desired through the Kara Sea. This is in alignment with the overall rule of avoiding any unnecessary high-latitude paths to emerge.



Current Extention-based Structure



Projected 'Enveloped Claim' Structure



Proposed 'Dual-Flow Restrainment' Structure

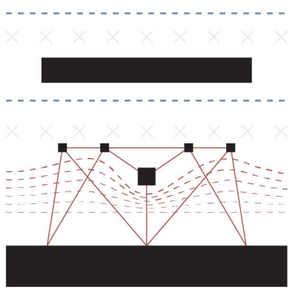


Figure 145. Developmental logics of extractive offshore infrastructure in the Snøhvit field, the projected future and the proposed alteration shift. Red lines indicate path of motion, eg. marine shipping routes or platform-to-shore connections.



EPSG:3575
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100 x 100km

Figure 146. Biophysical and operational conditions of the Barents- and Kara Sea along the North-west Passage, along with proposed nodal placements.

Transit Node: Kara Strait

Current 'Extended Claim' Configuration

All-year Ice
50% frequency

All-year Ice
50% frequency

Сабетта
Sabetta
local hub

Салехард
Salekhard
regional hub

Ob

Ob alluvial plain

Воркута
Vorkuta
regional hub

Варандей
Varandey
local hub

Нарьян-Мар
Naryan-Mar
regional hub

Longer Flights
to national hubs

Rapid permafrost thaw

to Laptev Sea
Northern Sea Route

Polar Bear Habitat
non-human territoriality

Kara Sea

Seasonal Ice
>50% frequency

All-year Ice
5% frequency

Белушья Губа
Belushya Guba
interim airport

Novaya Zemlya
Новая Земля

Open Waters
>50% frequency

Barents Sea

to Murmansk
barents sea

Transit Node: Kara Strait

Future 'Dual-Flow Restrainment' Configuration

Seasonal Ice
projected, RCP 4.5

Сабетта
Sabetta
local hub

marshland creation

to Laptev Sea
Northern Sea Route

TRANSIT NODE
Fixed Offshore Checkpoint
long term stay & observation

Restricted Fishing Zone

Kara Sea

TRANSIT NODE
Floating Offshore Checkpoint
mediating shipping traffic

Бе́лушья Ку́ба
Belushya Guba
interim airport

Seasonal Ice
projected, RCP 4.5

Novaya Zemlya
Новая Земля

Open Waters
all year

No-go Zone

No-go Zone

Transit Node Stop
emergency & maintenance

Platform transport
helicopter

Platform transport
boat

Barents Sea

to Murmansk
barents sea

Салеха́рд
Salekhard
regional hub

Ob

Ob alluvial plain

Бованенково
Bovanenkovo
regional hub

Mining route
train track & road

Бованенково
Bovanenkovo
local hub

Нарьян-Мар
Naryan-Mar
regional hub

Longer Flights
to national hubs

Rapid permafrost thaw

coastal erosion

Transit Node: Kara Strait, Kara Sea

T1: Embracing the Frozen

(Super)Surface



Figure 147. Intra-mobility in the air

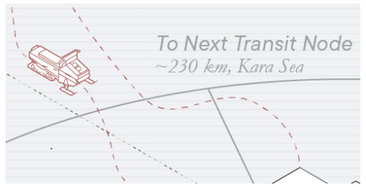


Figure 150. Intra-mobility on ice

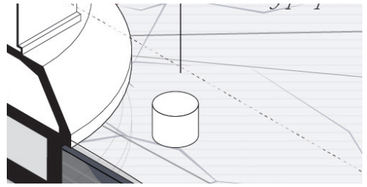


Figure 152. Ice as ground for activites near the platform

(Sub)Surface

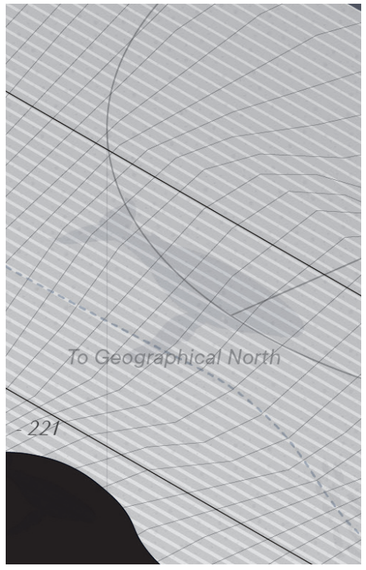


Figure 148. Non-human migrational monitoring

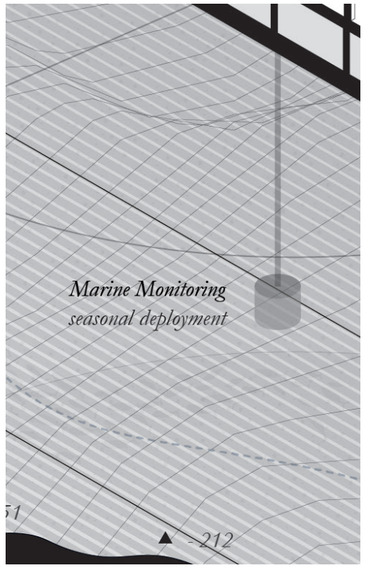


Figure 151. Scientific monitoring of the cryosphere

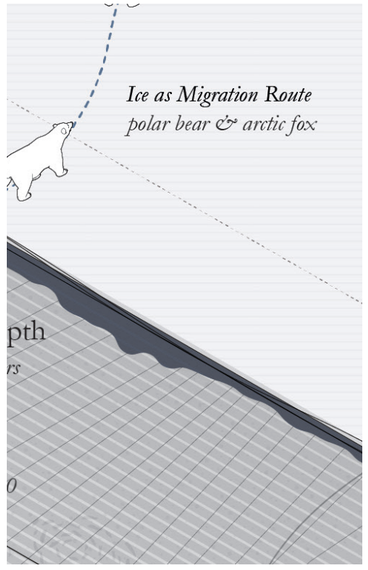


Figure 153. Non-human terrestrial migration monitoring

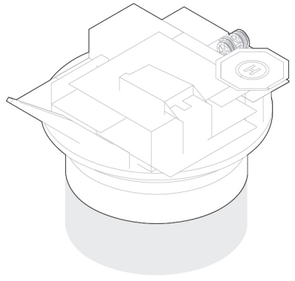


Figure 149. Observationally-oriented platform

A critical part to any Arctic node is to understand how it will operated during polar night and frozen conditions. Like the proposed floating node near the Kara Strait, one can simply follow the ice for the duration of winter as an observational node, before returning to a different position during summer. Infrequent commutes are expected, which also require the platform to cater to more personal needs and be well-connected to the mainland for resources, or have additional self-sufficient means of sustaining itself. What remain crucial is that the platform itself does not try to interfere with the ice, like the icebreaker. If anything are in need of moving, then that can be done on or above the ice rather than through.

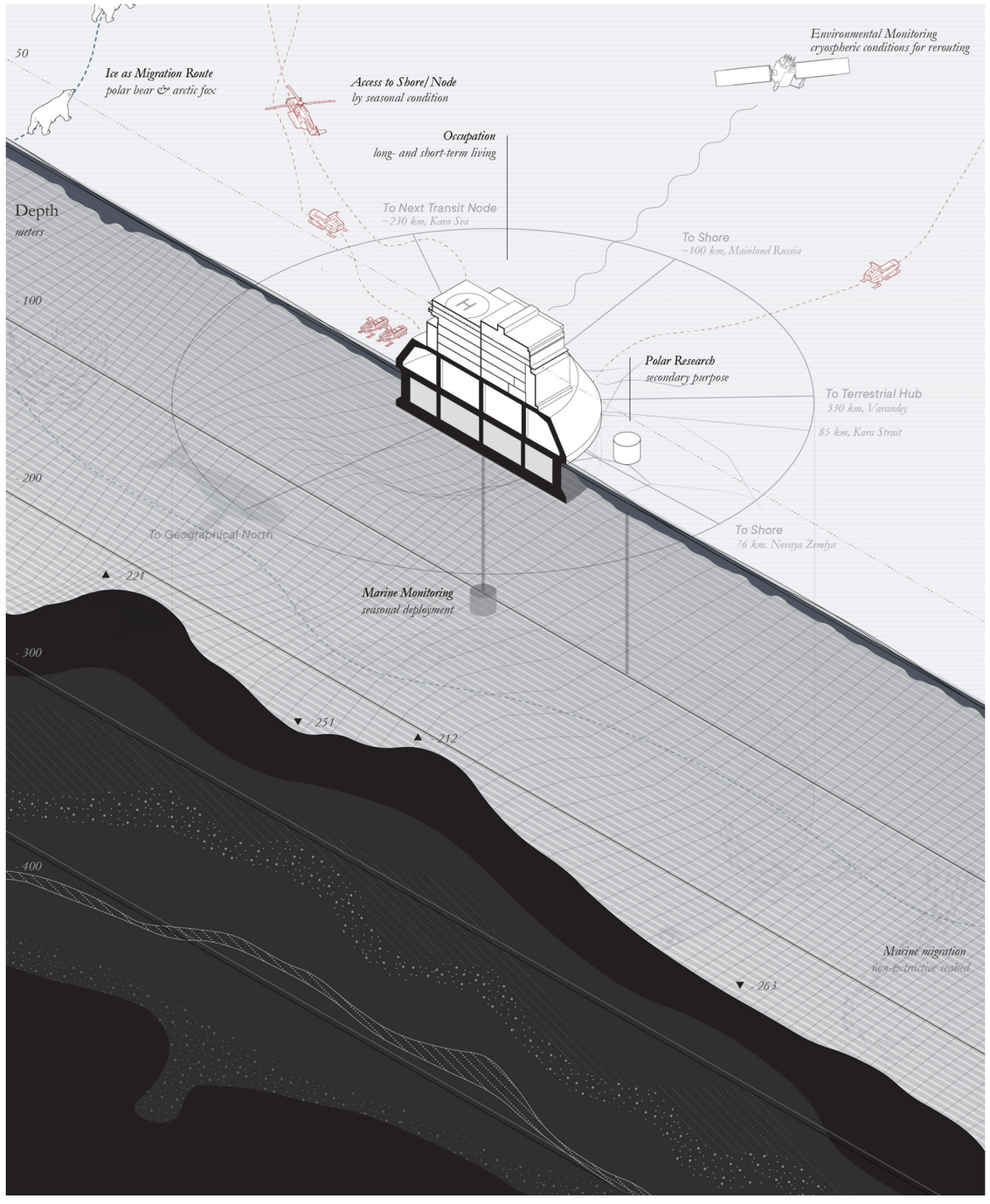


Figure 154. Section of an established, floating platform near the Kara Strait.

Transit Node: Kara Strait, Kara Sea

T2: Preparing for the Shifting Baseline

(Super)Surface



Figure 155. Intra-mobility

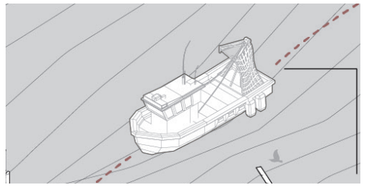


Figure 158. Terrestrial economical connection

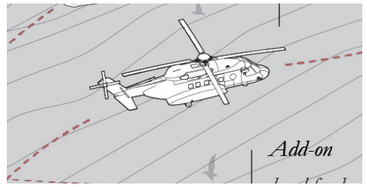


Figure 160. Territorial role

(Sub)Surface

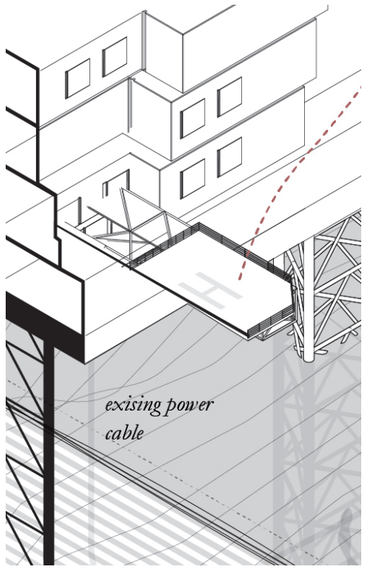


Figure 156. Non-human migrational monitoring

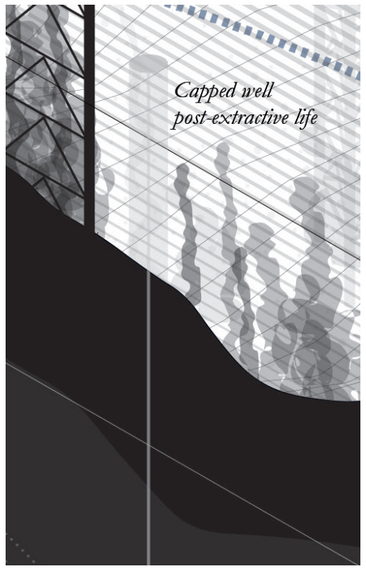


Figure 159. Out-phasing of extractive function

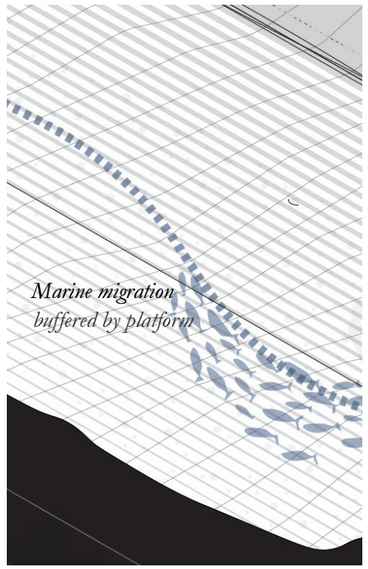


Figure 161. Sound and light consideration for non-human mobility

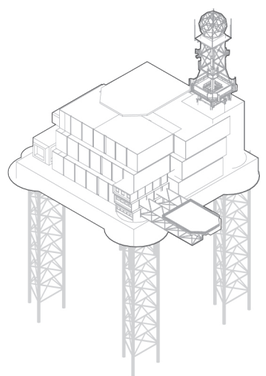


Figure 157. Knowledge-oriented platform

One inevitable aspect that the entire transit field will experience, is the shifting baseline syndrome. Fixed structures in particular cannot follow the biophysical conditions of yesterday to tomorrow, and so they are meant to represent how we can remember. Programming some platforms to serve as knowledge hubs or educational centers on top of their territorial role and more passive observatory function, can enable greater access to situated arctic offshore knowledge. These platforms will in the long run be the first to go beyond what many then will consider 'Arctic', and it is fair to assume that will follow a condition closer to the Western Barents Sea or even North Sea. Utilizing the Kara Strait as a migration corridor enable the platform to potentially be self-reliant food-wise, while also continuing to give crucial information about any changes. As stated before, the condition of water bodies close to an Arctic maritime entry gate will be the projection for those behind it.

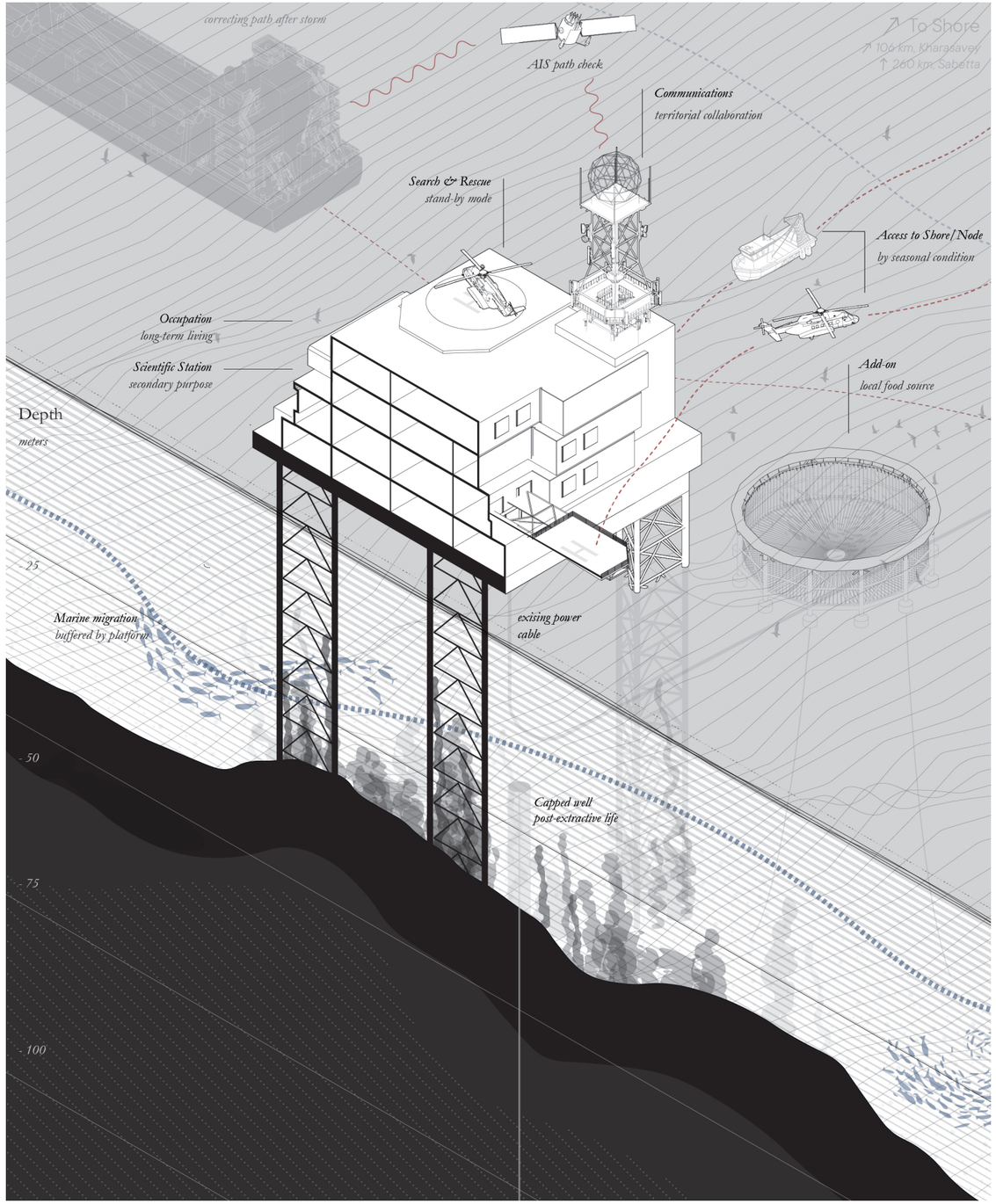


Figure 162. Section of an altered, fixed platform in the eastern Kara Sea.

Transit Field

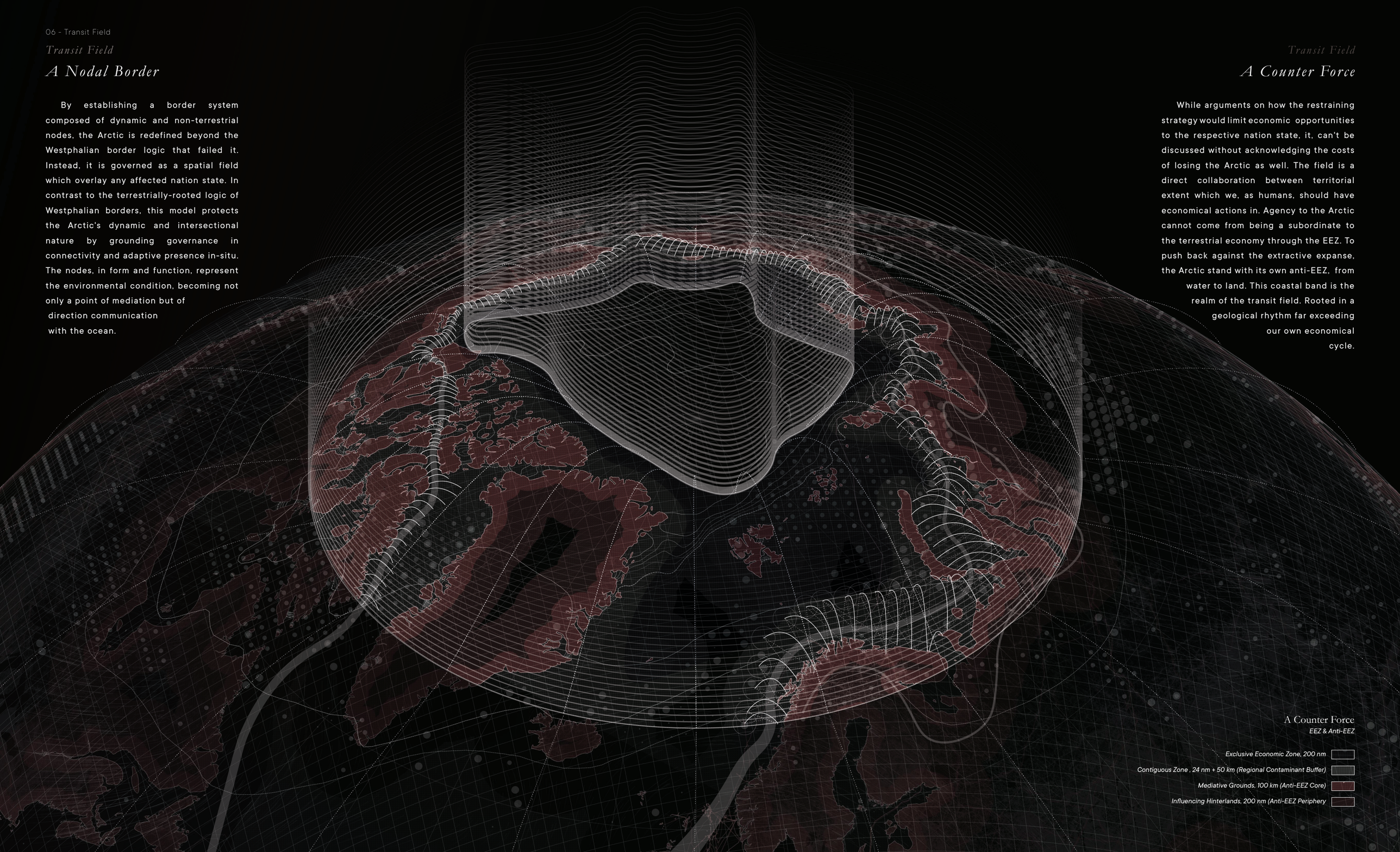
A Nodal Border

By establishing a border system composed of dynamic and non-terrestrial nodes, the Arctic is redefined beyond the Westphalian border logic that failed it. Instead, it is governed as a spatial field which overlay any affected nation state. In contrast to the terrestrially-rooted logic of Westphalian borders, this model protects the Arctic's dynamic and intersectional nature by grounding governance in connectivity and adaptive presence in-situ. The nodes, in form and function, represent the environmental condition, becoming not only a point of mediation but of direction communication with the ocean.

Transit Field

A Counter Force

While arguments on how the restraining strategy would limit economic opportunities to the respective nation state, it, can't be discussed without acknowledging the costs of losing the Arctic as well. The field is a direct collaboration between territorial extent which we, as humans, should have economical actions in. Agency to the Arctic cannot come from being a subordinate to the terrestrial economy through the EEZ. To push back against the extractive expanse, the Arctic stand with its own anti-EEZ, from water to land. This coastal band is the realm of the transit field. Rooted in a geological rhythm far exceeding our own economical cycle.



Proposition: Anti-EEZ

Terrestrial Arctic EEZ

The Anti-EEZ, or Terrestrial Arctic EEZ (TAEEZ), is a hydrologically-based territorial buffer zone extending inland from the Arctic shoreline. Its main purpose is to regulate land use and industrial activities by their impact on Arctic waters and overall contamination potential. It assigns legal weight to the ocean as an active jurisdictional entity, making rivers, runoff, and watersheds instruments of Arctic governance within a legal realm that is familiar.

It comprise of two main elements: (1) the immediate coastal area, equivalent to the continuous zone in concept, which span 0-50 km from the shoreline. (2) the terrestrial hinterland, equivalent to the wider EEZ, which span 50-200 km from the shoreline. This buffer zone, or rather marine-imposed strip, can be drawn in parallel to 'The Strip' from Rem Koolhass & Elia Zenghelis' '*Exodus; or the Voluntary Prisoners of Architecture*' (1972) in which they manipulate the material and expressive, or rather spatial and psychological, division between two inherently inseparable entities, here the terrestrial and marine. By replacing the anthropocentric basepoint of 'Exodus' with the Arctic territory's base, water, the systematic elements can be translated into a spatial system for TAEEZ. As seen in *table 3 & 4*, the two zones within TAEEZ, effectively 'the strip', many functions remain within both. Certain aspects, such as the connection to the offshore nodes of the transit field and shore conditions remain deeply embedded in the coastal zone.

It is here one can also assume the greatest influence on future developments of Arctic settlements. Port cities will be radically altered to instead serve the closest nodes, and therefore have its activity shifted into the domain of the Arctic. Conversely, the inner zone of TAEEZ carry more importance on managing the extractive industries fueling the port cities of today. Overall river monitoring and downstream-conscious operations are essential. As permafrost thaw in the hinterland, while the coast erode further down, this spatial reading and regulatory division will appropriately react to the changing conditions of the Arctic territory.

Table 3: Main components of the TAEEZ, as understood through a spatial reading of 'Exodus' (1972).

Element	Primary Spatial Function	Primary Regulatory Position	Economic Implication	Developmental Implication
Anti-EEZ, or Terrestrial Arctic EEZ [TAEEZ] (The Strip)	Organizes land into decreasing Arctic hydrological sensitivity from coast inward	Scale potentially disruptive anthropogenic activity by distance from Arctic watersheds and sensitive outlets.	Creates tiered land value based on water impact. Higher compliance cost near coast and immediate discharge areas	Forces spatial redistribution of industry away from Arctic-draining zones
Zone I: Coastal (0-50 km) (Sub-strip)	Tight industrial and developmental control over immediate, local pollution	Refrain from build new extractive or polluting infrastructure	Coastal land becomes restoration/ monitoring economy, and a collapse of extraction-based real estate is expected long-term	Coastal development becomes ecological infrastructure rather than urban expansion, as they control the access to the transit field
Zone II: Hinterland (50-200 km) (Sub-strip)	Control pollutants before they enter rivers flowing to Arctic	Regulate runoff from industrial and urbanized areas, cap extraction intensities, and enforce basin-level pollution budgets	Emergence of water-accounting, compliance, and remediation markets	Industrial development shifts to low impact downstream and closed-loop systems for own waste

Table 4: Terrestrial developmental and (eco-)nomical implications, and regulatory function of the TAEEZ, translated from 'Exodus' (1972).

Element	Zone	Primary Spatial Function	Main Regulation	Economic Implication	Developmental Implication
River Basin Boundaries (Walls)	I. Coastal II. Hinterland	Define administrative and collaborative units by watershed, not political borders	Do: treat basins as recognized managerial units. Don't: ignore cross-boundary, transnational water flows	Resource pricing becomes basin-specific, as liability becomes transnational	Planning systems reorganized around catchment dynamic instead of solely individual nation states or counties
Hydrological Control Nodes (Rooms)	I. Coastal (primary) II. Hinterland (supportive)	Spaces that measure, clean, and regulate water flow from polluting upstream sources	Do: maintain retention landscapes, wetlands, natural filtration systems. Don't: block or increase runoff speed or channelization	Infrastructure economy shifts toward ecological engineering and water design	Urban form become distributed across ecological processing landscapes
Arctic Parliament of Commons [APoC] (Central Authority)	I. Coastal II. Hinterland	Pricing and governance center for Arctic impact	Do: pay Arctic levies, trade ecological credits Don't: externalize environmental damage to Arctic systems	Arctic becomes a pricing authority, as ecological credits become financial assets	Investment decisions must account for Arctic impact pricing
Ecological Compensation Mechanisms (Rituals)	I. Coastal II. Hinterland	Mandatory restoration actions tied to development	Do: restore wetlands, rewild rivers, stabilize permafrost zones Don't: extract without offsetting hydrological damage	Restoration becomes a parallel investment sector	Every development project include ecological production component
Hydrological Accounting System (Surveillance Layer)	II. Hinterland	Tracks water, sediment, and carbon flows into Arctic system	Do: monitor all major basin flows Don't: operate without traceability systems	Remote and in-situ data economy emerge, deeply linked with the global remote sensing network	Development requires continuous environmental monitoring integration
River Mouth Interfaces (Edge Condition)	I. Coastal	Active negotiation zones where land meets Arctic waters	Do: enforce zero untreated discharge, maintain estuarine systems Don't: industrialize deltas or bypass filtration systems	High-value regulatory checkpoints with heavy compliance cost zones	Urban expansion constrained, as nature become the core infrastructure
Arctic Stakeholder Economy (Actors)	I. Coastal II. Hinterland	Converts firms/states into compliance-based participants	Do: earn access through compliance and restoration. Don't: operate without Arctic impact assessment	Competitive advantage shifts to low-impact operators	Development become conditional on ecological legitimacy
Nodal Hubs (Reception)	I. Coastal	Primary establishment and connection to offshore nodes and the outer transit field	Do: provide aerial and marine connections to nodes Don't: operate with excessive traffic along transit nodes	Offshore and logistical or transit-based economies emerge	Developments will grow in tandem with the nodal role and significance over time

Proposition: Non-Westphalian Governance

Reformatting the Expressive Constructs

In order for the Arctic Transit Field to be even conceptually plausible, a radical transformation of existing governance and global definitions must be undertaken. The analysis have shown the severity of notional legacies being embedded in political and social constructs to systematically pacify the Arctic. This is particularly the case for the Arctic Council and its perpetuated legacy of Arctic Exceptionalism within the global Westphalian regime.

Through both the analysis and the design exploration, the following leverage points in an expressive territorial understanding are:

1. The Arctic, as a body of water, cannot currently be treated as a recognized territory through Westphalian-based treaties such as UNCLOS, CLCS and IMO.

2. The Arctic Council will not, in its current state, be able to operate in a globalized and contested environment.

This directly fuel two counter-measures that this research propose:

1. A declaration of the rights of the Arctic, DoRA, based on the current post-Westphalian legal movement Rights of Nature (RoN) to provide a politically represented territory.

2. A radical transformation, or replacement, of the Arctic Council where it is repositioned to an organization with active regulative power the Arctic. An Arctic Parliament of Commons, APoC.

The necessary paradigm shift to legally recognize the Arctic as an active agent will be critical for a transformed Arctic Council to be operational. A recognition of the Arctic as a global common must be embedded in both the higher legal order, and the overall goal and ambition of the organization. Rather than an Arctic council of purely nation states and indigenous representatives, it is now closer to a parliament of commons. The embodiment of political ecology, more-than-human stewardship and post-Westphalian governance in one. This allow the new Arctic Council, or rather the ***Arctic Parliament of Commons***, APoC, to be capable of governing what is inherently a dynamic Arctic territory through the transit field.

Much of the existing governance structure within the Arctic Council and current cooperative bonds across nation states through it are therefore not scrapped. While the final outcome could eventually differ from the proposition due to unaccounted or unforeseen sources, a reformatting is still considered a very likely path over a complete replacement (Axworthy, 2012; de Jonghe, 2025; Koivurova, 2009).

A main foreseeable challenge would be the geopolitical approval of another active, and therefore nationally compromising, Arctic power, even if it acts with global intents. The current international and national regulations for the Northern Sea Route would all fall under the jurisdiction of the APoC. The APoC would ultimately function as the global representative to translate global, legal frameworks provided through the IMO, as with its codes for polar waters and safety regulations, on behalf of protecting the Central Arctic Ocean. However, the 'activization' of the organization would also directly respond back to the IMO and being able to oppose or strengthen any regulations within its territory.

A recurring theme throughout the expressive establishment of the Arctic territory is the power of perception in such a politicized space. Nation states along cannot be convinced to alter a system they are embedded in, so it is the global notion that must inform them externally. Indigenous perceptions of a relational homeland provide many answers to where the Westphalian model fall short, yet it has to be strengthened on a global scale to have any measurable impact. This notional paradigm shift is perhaps what might take the longest to realize. Therefore, in this race against time and ourselves, an early declaration of the rights of the Arctic, DoRA, is of upmost importance to start the shift. The material and expressive parts of the Arctic territory will coexist and enhance eachother. DoRA will facilitate the realms in which the nodal platforms can operate, and in return the nodes validate and establish the material border of the Arctic.

This positive feedback loop between the expressive and the material aim to establish the Arctic as territory through a continuous, iterative process of responding to both the biophysical environment and the socio-cultural developments.

Proposition -----
Existing ——
Scale
Propositional Key Moments

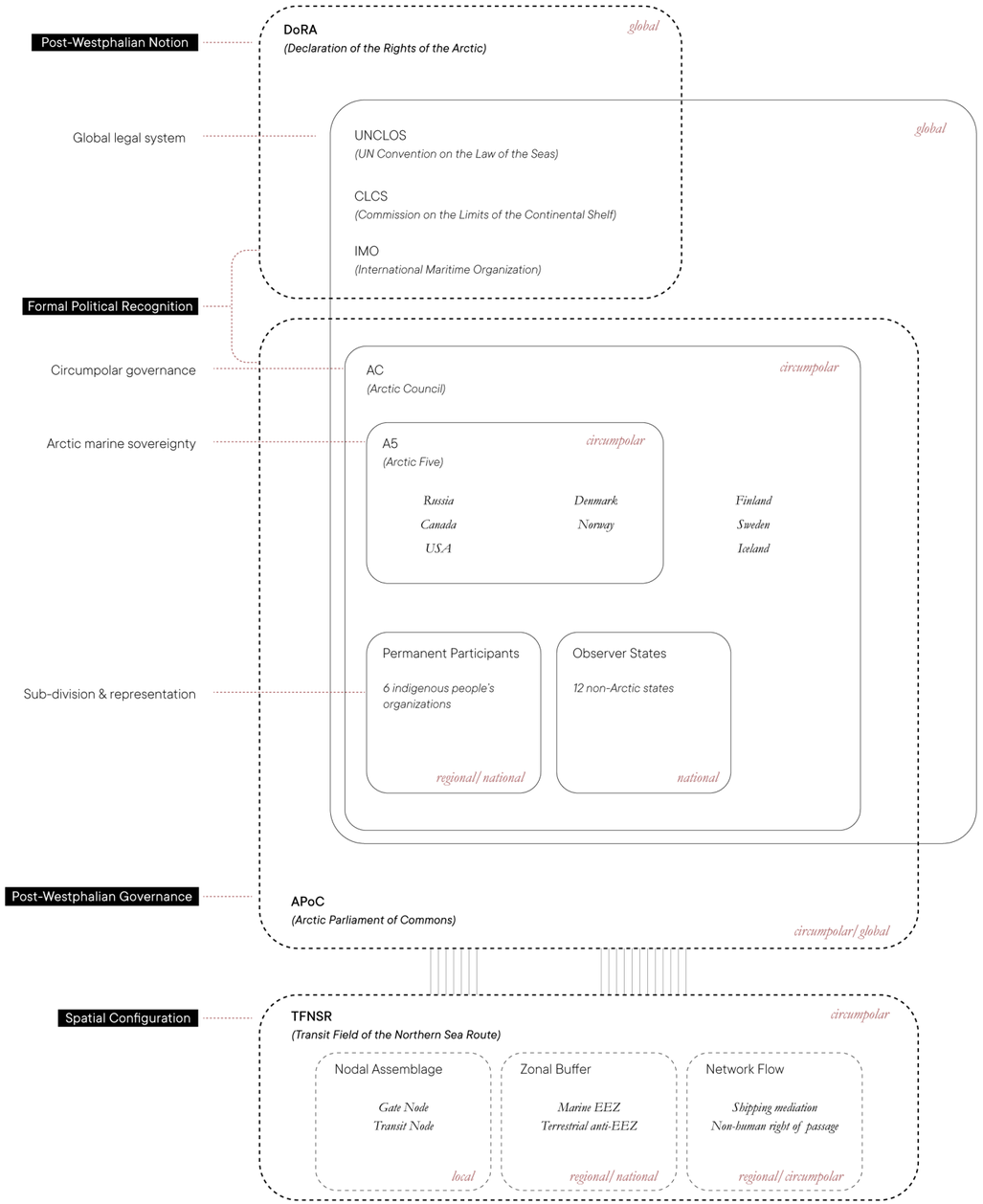


Figure 163. Overview of the expressive to material alterations needed within existing goverance towards the facilitation of an Arctic Transit Field (adapted from De Jonghe, 2025)

Proposition: DoRA

Declaration of the Rights of the Arctic

The Declaration of the Rights of the Arctic, DoRA, builds upon pre-existing declarations of bioregions such as the Venetian lagoon (2026) and Mar Menor (2022) to embed the biophysical qualities into the core of what the Arctic must be recognized and protected for.

The Arctic as territory is a subject of law, not merely an object of which law is confined to. Its rights derive from its existence as a living, dynamic territory and shall be respected by all public and private actors. Where uncertainty exists, interpretation shall favor the protection, continuity, and flourishing of the Arctic in terms of its planetary role as a climate regulator. The Arctic ocean and its cryospheric extent in particular shall be regarded not as a terrestrial extension to be fragmented, conquered and subjugated to land, but rather as a coherent legal and territorial entity to which humanity bear the duties of maintaining.

Beyond this paragraph are a set of rights inspired by the aforementioned RoN cases. As a whole, these rights will set the stage to institutionally recognize the many Arctics within, while adhering to a coherent Arctic territory to withstand the ever-imposing anthropogenic enclosure.

1. Right to Territorial Existence, Persistence & Integrity

The Arctic has the right to maintain its territorial integrity as an interconnected system of waters, sea ice, atmosphere, non-human- and human communities. No activity or nation state shall intentionally or negligently fragment, destabilize, or irreversibly alter its fundamental ecological functions within its realm.

2. Right to be Recognized and Represented as a Legal Person before the Law.

For legal matters beyond, or within the territory, the Arctic must be represented in court no different than a human.

3. Right to Ecological and Sociocultural Integrity.

Millenia-old natureculture relations, customs and traditions across the many indigenous groups of the Arctic are inseparable from what constitute to its territorial content. These relations must not only be protected, but also embedded in representation of the Arctic as a whole.

4. Right to Co-Exist, Co-Evolve and Co-Create

Indigenous, local inhabitants and non-human actors all equally possess inalienable rights to (1) participate in governance, (2) maintain traditional ecological knowledge systems, and (3) be recognized as essential caretakers of co-existence, -evolution and -creation. No governance framework shall exclude or subordinate Indigenous authority in Arctic decision-making.

5. Right to Freedom from Exploitation

The Arctic has the right to be free from activities that treat it solely as a source of extraction, profit, or strategic advantage. Activities involving resource extraction, industrial development, shipping, or infrastructure shall be subject to the prior demonstration that they do not violate other rights of the DoRA.

6. Right to Transnational Flow of Ecological Matter

Sedimentation, water-carried nutrients and non-human migration must be able to cross and flow freely throughout and across nation states.

07

Closure

Discussion & Conclusion

[...] while the voluminous and fluid oceans are not fixed, neither is land territory...

[...] not only does the regime of maritime sovereignty need to be rethought, but also that of territorial sovereignty, with implications for the broader international rules-based order.

Rebecca Strating & Joanne Wallis,
Maritime Sovereignty and territorialization (2022)

Design Evaluation

Assessment

Bringing back Donella Meadows' Twelve-set criteria to assess any complex system intervention shed light on the propositional flaws and strengths. Notably, the project overall manage to hit most of the criteria, except for system delay and strengths of positive feedback loops. This is in part due to the potential overfeeding of information that can happen with a constantly informed node. Alternatively, it can be underfeeding information too if only checked annually for the seasonal repositioning from the biophysical indicators.

The proposition rely more on a negative feedback loop with the retainment strategies, than a positive, even though that is attempted to achieve through by connecting local economies to the nodes.

The biggest strengths of the proposition lie in its inherent self-organizing transport system. This is closely followed up by the systematic repositioning it takes on the Arctic, now viewing it as an active territory. Addressing the territorial notional paradigm by first understanding the notions themselves were also viewed in a favorable light. Though the nodes can only provide with low-volume experience, it cannot be seen as a notional .change for a wider audience without further reasoning.

The establishment of the counter-force in terms of an anti-EEZ, mediation buffers for non-human migration and the overall width of the transit field score high on the low-impact leverage points.

Overall the proposition according to the assessment criteria are seen as impactful on the large notional shifts, territorial structure and the management of inputs and outputs of the system. However, there are notable shortcomings in generating sound feedback loops and access to the in-situ experience generated by each platform. While the nodes are meant to be limited in access by most accounts, measures to spread knowledge generated must be developed further.

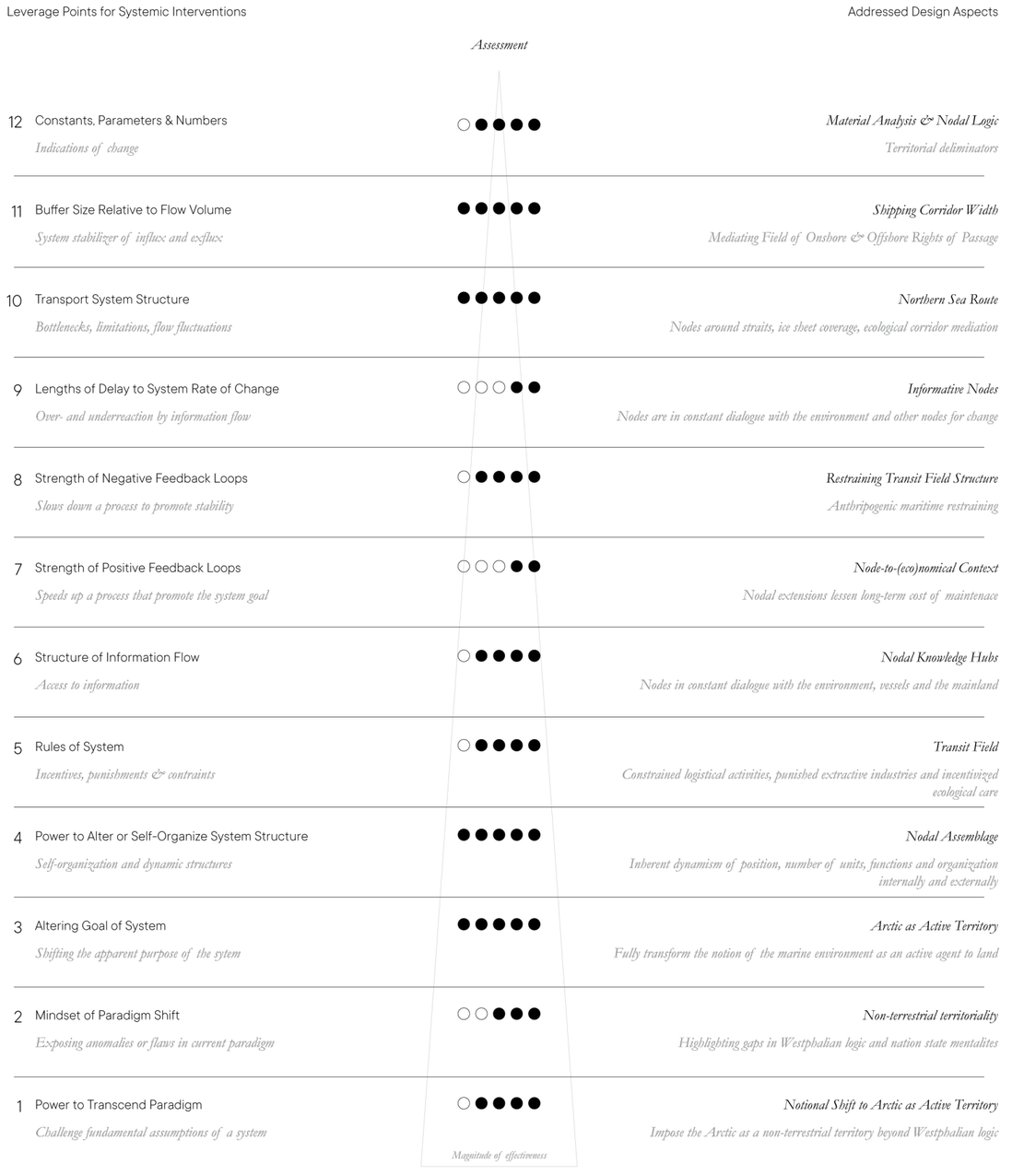


Figure 164. Assessment of Transit Field proposition and design through Donella Meadows' Twelve leverage points for systemic intervention. Overall a decently impactful systems intervention, though with some shortcomings.

Main Research Question

How can the Arctic, as maritime territory, be given agency to mediate offshore and onshore activity along the Northern Sea Route?

Territorial agency can be derived into three aspects: the intrinsic material power, political recognition and spatial configuration. Given the non-terrestrial context, and thereby more-than-Westphalian nature of the Arctic as a territory, it can be given a form of agency through manipulation of the imposing anthropogenic forces. Rather, by creating a counter-force to the expanding Northern Sea Route. That was done by:

1) setting the intrinsic material power to be the Arctic's planetary climate role as a cooling engine in need of proper protection

2) placing the transit field within the exclusive economic zone of Arctic countries to have an economical interest and somewhat control of certain nodal activities, while placing the main responsibility on an international forum

3) creating a spatial configuration which structurally mediate the rights of passage between humans and non-humans along the Arctic shore.

The controlled restraining with environmentally informed, dynamic nodes allow for a non-Westphalian border to emerge and represent the Arctic more accurately than most fixed and limited boundaries today. Instead of attempting to provide agency for a non-terrestrial territory through the Westphalian logic, it is being given through a relational and infrastructural model of sovereignty where systemic participation keep the transit field in line. Given the global interest of the Northern Sea Route and the far-reaching projection on cryospheric shrinkage, it is of best interest to mediate and restrain current close-shore developments to protect the inner Arctic core.

Sub-Question Conclusion - Analytical

A1: To what extent have notions of the Arctic informed its legal, economical and developmental direction?

External notions such as the desolate bioregion, extractive frontier, arctic exceptionalism and geopolitical scramble, have significantly shaped the division and trajectory of the Arctic. The enduring image of the Arctic as an empty, remote, and resource-rich frontier helped justify territorial claims, colonial expansion, and extractive industries which is just one example of how external notions built up on eachother. This ultimately overlooked the presence, rights, and knowledge systems of Indigenous peoples. While recent decades have shown a gradual shift how the region it perceived, and greater representation from indigenous groups to express the internal notions, it is still largely embedded in the state-centered legal system. The legacies of notions, particularly that of Arctic Exceptionalism have rendered the circumpolar governing platform, the Arctic Council, inoperable once met with internal or external conflict.

A2: What are the current legal and governing issues in relation to the Arctic and non-terrestrial territories?

The Westphalian system, which is based on territorially bounded by sovereign terrestrial states, struggle to adequately govern non-terrestrial or global commons such as the Arctic Ocean. The terrestrial bias seep into the global legal frameworks, including the United Nations Convention on the Law of the Sea, UNCLOS, despite how it by nature should be representative for the seas. Instead, UNCLOS perpetuate the notion that the sea is a subjugate to land through legal recognitions of exclusive economic zones and extended claims for extractive purposes. On beyond the EEZ, the legal framework fall short of delegating responsibility of management, other than stating that these areas are a global common. This lead to a clear separation between how global commons are treated. While Antarctica is given the international status as a global common and managed appropriately so, the Arctic fall through due to its non-terrestrial territorial dominance. This is further amplified by the role of the Arctic Council as a cooperative governance platform with no legislative power, rather than a sovereign authority.

A3: What are the current anthropogenic and biophysical reterritorial forces within and around the Arctic?

There are emerging hydrocarbon extractivism in large parts of the Russian, American Arctic and partly in the Canadian, all with mining as another significant onshore extractive force. Offshore territorialization, in alignment with rampant Atlantification of the south-western Arctic seas, have manifested itself through fishing. Additionally there are significant offshore developments in the Barents, Kara and Beaufort Sea, with particular projected growth in the first. Borealization of the land remain the most prevalent biophysical reterritorial force, having significant effect in the Russian Arctic and eastern Canada. These two trends happen at the same time as most Arctic settlements experience a population decline, while industrial presence rise. The greatest change however to the current state of the Arctic is the impending split of the cryosphere into a maritime and terrestrial realm, only seasonally connected over the Arctic archipelago in Canada. This split is what will continue to fuel the anthropogenic territorialization seen along the Russian Arctic coast as a part of the Northern Sea Route.

A4: What non-extractive intrinsic material value does the Arctic inhabit within and throughout seasons?

One of the most significant material values of the Arctic is its role in global climate regula-tion. The cryosphere, as in sea ice, glaciers, and permafrost, all act as a dynamic reflective and insulating system. Seasonal expansion and contraction of sea ice regulates Earth's al-bedo effect, reflecting solar radiation in winter and early spring and absorbing more heat in summer when ice retreats. In combination with the relative stagnant air within the polar vortex create a massive cooling chamber which is constantly sent down to cool temperate and tropical areas. Due to the accumulation of air, it is also seen as a particularly sensitive region for atmospheric contamination.

Additionally, permafrost and sea ice function as long-term carbon storage systems. Their seasonal stability and instability directly affect greenhouse gas release, leading back to highlight how sensitive the bioregion is towards cryospheric change. Another often ne-glected material value is the ice itself. Both as a nature-cultural binder for indigenous and non-indigenous Arctic communities, but also for historical records on the planet's condi-tion.

Sub-Question Conclusion - Design

D1: How can existing offshore platforms be operationally reprogrammed based on both biophysical and anthropogenic conditions?

The project utilized four spatial criteria, that being distance to shore, distance to neighboring node, distance to seabed and nodal volume of cluster, to determine appropriate functions on the nodal scale. The territorial input and logic onto the nodal programming stemmed from what role a node should have within the transit field, so either as a gate node or transit node. When the spatial power and operational extent was set, the biophysical conditions would determine how it each feasible program would be best utilized for the seasonal condition. Seasonality played an essential part in weighing the final local programming.

D2: How can new offshore platforms be positioned and configured to mediate the Northern Sea Route with both human and non-human flow in mind?

The desired position to enable an intrinsic mediating power came from overlaying shipping data with ecological corridors. In areas where they both converge, eg. in a narrow pass or a strait, a platform or node would be placed accordingly so the path of least resistance would yield leeway for non-human migration to pass alongside the Northern Shipping Route. This was again overlayed with the operational extent so see which nodes could be given extra leverage power to pull the shipping route further from ecologically sensitive areas.

D3: How can offshore platforms challenge and improve the Westphalian governance model of the Arctic?

Offshore platforms challenges Westphalian governance in three ways. Firstly, it destabilize the assumption that offshore infrastructure exists to extend state resource control. Instead, it can serve transboundary ecological or scientific purposes that exceed national interest. Secondly, it created governance ambiguity. Responsibility for maintenance, liability, and jurisdiction becomes distributed across states, institutions, and potentially non-state actors such as scientific consortia or Indigenous organizations. Third, it shifts authority from territorial possession to operational stewardship where legitimacy comes from managing systems such as ice, global logistics and the common values of the Arctic, rather than controlling land or seabed

At the same time, platforms can improve governance by acting as nodal point for regulation and monitoring in remote Arctic waters. They enable environmental data collection, safety enforcement, and operational standards in areas where state presence is otherwise limited. Through cooperation frameworks like the Arctic Council, they can also help translate soft-law environmental and safety norms into practice.

D4: How can offshore urbanization in the Arctic Ocean build on a new Arctic notion?

Offshore urbanization in the Arctic Ocean build on a new Arctic notion by shifting the region away from inherited ideas of emptiness, frontier extraction, or Arctic Exceptionalism , and toward an understanding of the Arctic as an inhabited, infrastructural, and relational space embedded in global environmental systems. It does so by challenging the Westphalian logic, but also on two other aspects.

Firstly, it supports a shift from territory to networked spatiality. Under frameworks like UNCLOS, the Arctic is legally segmented into national zones, but offshore urban systems would function across these boundaries, requiring cooperative governance beyond strict territorial control. Secondly, it reinforce the Arctic as a socio-ecological system by making the environmental interdependence visible and materially unavoidable through pure exposure.

Lastly, like how previous platforms have challenged the ideas of territoriality, Arctic offshore urbanization can open the door for a reinterpreted Arctic Council which can step away from its deeply-embedded notion of Arctic Exceptionalism. Without addressing the needs raised by the platforms existence, the Arctic cannot be managed cooperatively in the long run, across times of both peace and geopolitical crises.

Impact

Implications & Further Recommendations

The main analytical findings point towards the processes covered within the theories of planetary urbanization, whilst the design findings support the territorial creation from a deleuzoguattarian standpoint. This open up the possibilities for further experimentation on non-Westphalian territories and offshore territories in general.

One example the latter can directly contribute to is how one define a territory that has sunken. The island state of Tuvalu will in the future become completely submerged. When that happens, it is legally speaking the equivalent of the Arctic Ocean. The legal gaps in UNCLOS that have been addressed will in Tuvalu's case result in the loss of an EEZ equivalent to the size of Nigeria, or around 900 000 km2. Island state legitimacy and post-terrestrial states are extreme cases of global warming, but they are happening nonetheless.

Returning to the creation non-Westphalian territories. This in particular, from the perspective of the three territorial components: the intrinsic material, political recognition and spatial configuration, can further support the legitimization of indigenous territories as criteria trifecta.

For any further research, it would therefore be key to put indigenous communities with notions of territorial relationality on the central stage, and from there dissect the trifecta to how the space it used and for what.

Scientific Reflection

On Graduation Process

How did the research and design process work out (or not) according to the original plan (and why/why not)?

Over the course of almost eight months, I have gotten to dip my toes into the world of Arctic territoriality and geopolitics. From discussions in Brussels to experiencing the high Arctic first-hand on Svalbard. Each event highlighted new sides of the story that I hadn't given much attention too. While that input slowly over time gave a clearer view of the complexities of the region, it also gave a greater confusion as what to focus on. The process and overall thesis narrative greatly deviated from every plan set at every milestone, which definitely left its mark on the final products.

Certain methods and elements from the planning was used in the end, and surprisingly even some of the first maps from the initial week. In some ways, it goes to show that the track had been there for long, and I just needed to find it. I knew from the beginning that I wanted to deepen my understanding of systemic thinking and territoriality. To some degree, I have managed to do so, but retrospectively now see that the scope was too broad to efficiently tackle this to achieve a level of sufficient detail.

A great contributor to what led up to this chaotic rhizome of a process was lacking purpose-driven plans. When my initial problem statement didn't fit the imagined problem anymore, much of the planned progress was simply thrown away. If I were to repeat a similar project again, I would narrow the scope first, seek out alternatives early on and be specific for whom I wish to plan for to know specifically what to do ahead of time.

On Methodology

How are research and design related in the project?

The research built up the foundation for what the material and expressive properties of the Arctic territory is. The structure of splitting the territorial understanding into these two topics, which equally represent the material and immaterial, or space and policy, came from the main philosophical drivers of the project, Gilles Deleuze and Félix Guattari in their work 'A Thousand Plateaus' (1987). In theory it synthesize a territory elegantly into different, constantly changing states of being. When attempting to conceive of way to represent and design the inherently dynamic Arctic as a territory, I knew I had to go beyond the limitations of the current nation state logics.

Therefore, through a deleuzoguattarian territorial understanding could a design emerge, and it did eventually. The rationale of utilizing nodal configurations as borders in the design directly stem from the analytical logic. Each design node are directly linked and informed by the territorial understanding of anthropogenic territorialization and biophysical deterritorialization. The design question then was fairly straight forward in retrospect, namely how can these two best be mediated to reterritorialize the Arctic into a favorable outcome.

In the end, the design ask for constant information from the research basis to exist, and the research basis again create a cyclical knowledge loop to inform the next design configuration per annum.

Value & Transferability

The main value of the project would be the contribution towards arctic offshore urbanization and more-than-terrestrial territory-making. While there are a great many elements that are in need of refinement, the systematic approach to demarking non-Westphalian territories through biophysical and anthropogenic conditions can be transferred to further projects. In a similar fashion to Louis-Edmond Hamelin's index of Nordicity, a development of a more-than-terrestrial Nordicity index could emerge from this approach.

Another value that hasn't been discussed in depth but emerged throughout the designing phase was the possibilities of designing beyond growth. While the design inherently expect growth along the Northern Sea Route, it is not strictly dependent on it as it follow the intensity of the traffic volume in terms of nodes.

Limitations

The main limitation of this project is arguably on the lacking indigenous representation and exposure throughout the making-of-territory. While they are acknowledged as a central part of the Arctic territory and the management of it, any deeper understanding of relational territories and internal notions were left either out or greatly underexplored. Further research on this topic would certainly have to include these visions on what an Arctic territory could be, and how the offshore nodes could strengthen the local communities affected by altering environment. Another limitation with the conducted research work it the underdeveloped governance aspect of managing the nodal network. While this thought of as a longer section, it ultimately had to be cut due to time.

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Figures

[Figure 2]: Karlee Heck. (n.d.). Monochrome offshore oil rig in misty sea [Photograph]. Pexels. https://www.pexels.com/photo/monochrome-offshore-oil-rig-in-misty-sea-34273480/

All other figures & tables were made by the author

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"All collected data had come to a final end.
Nothing was left to be collected.

But all collected data had yet to be
completely correlated and put together in all
possible relationships.

A timeless interval was spent in doing that."

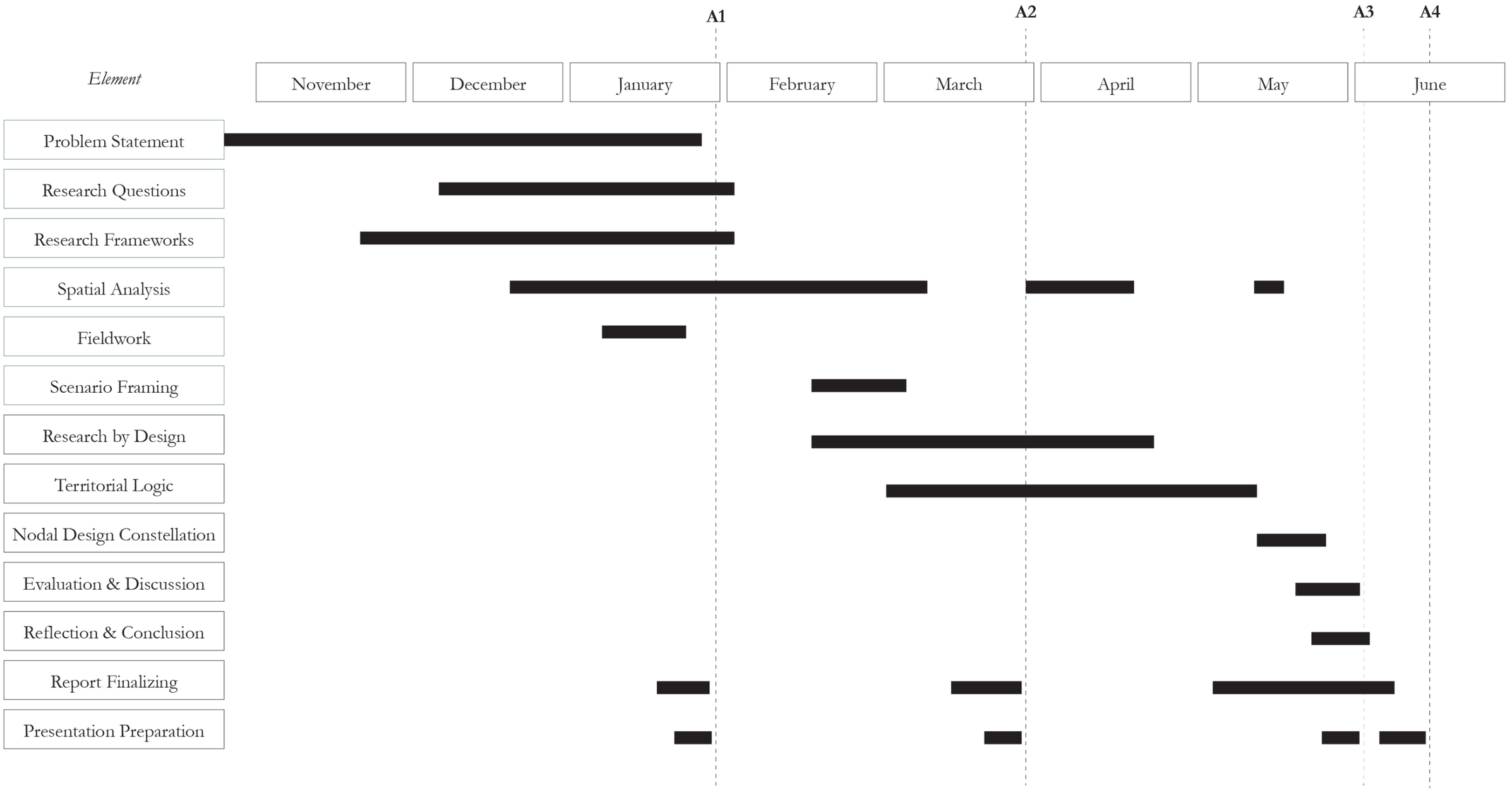
The Final Question (1956)
Isaac Asimov

Do we have time to answer ours?

Appendix

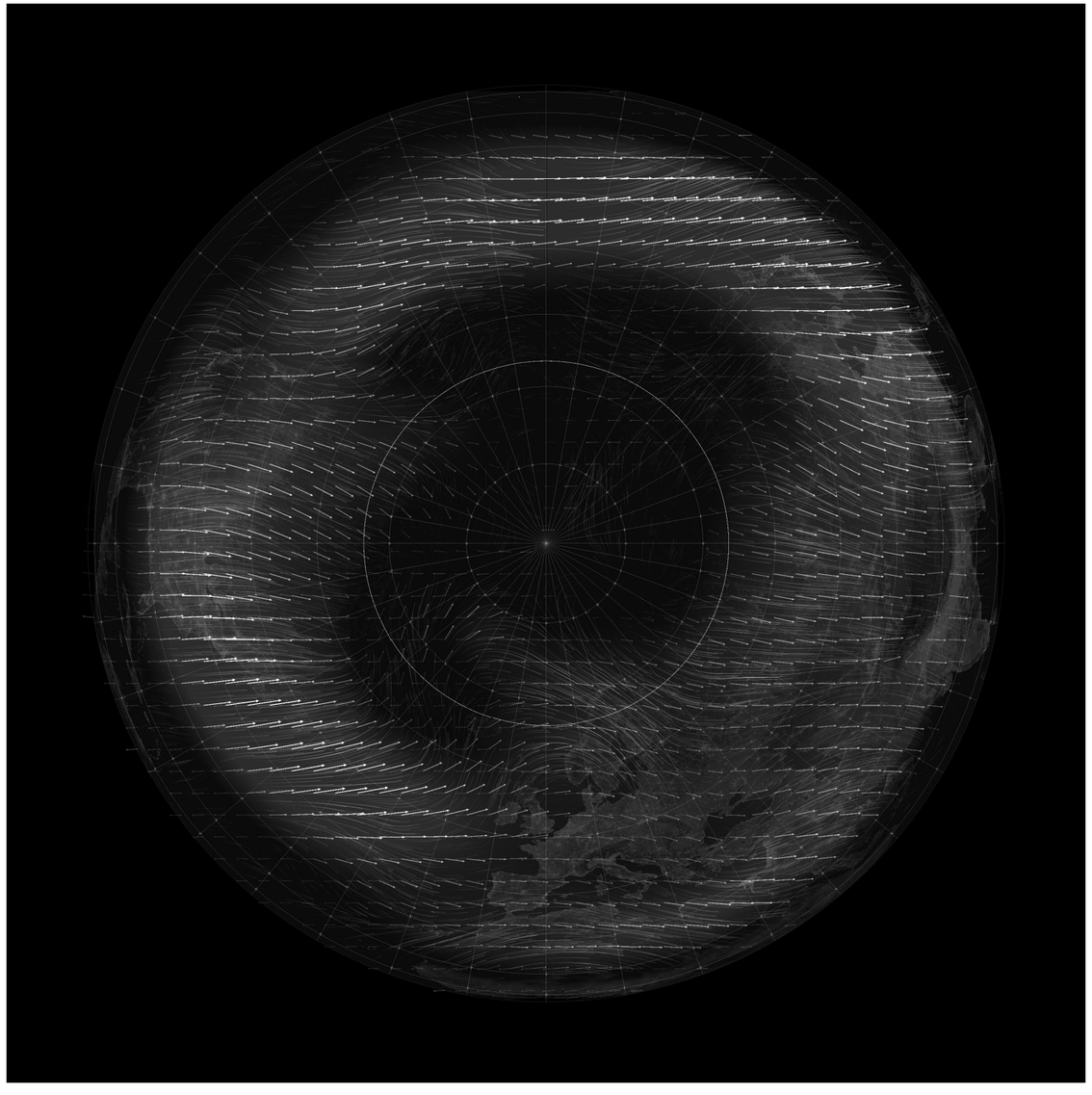
Planning & Additional Products

Project Timeline



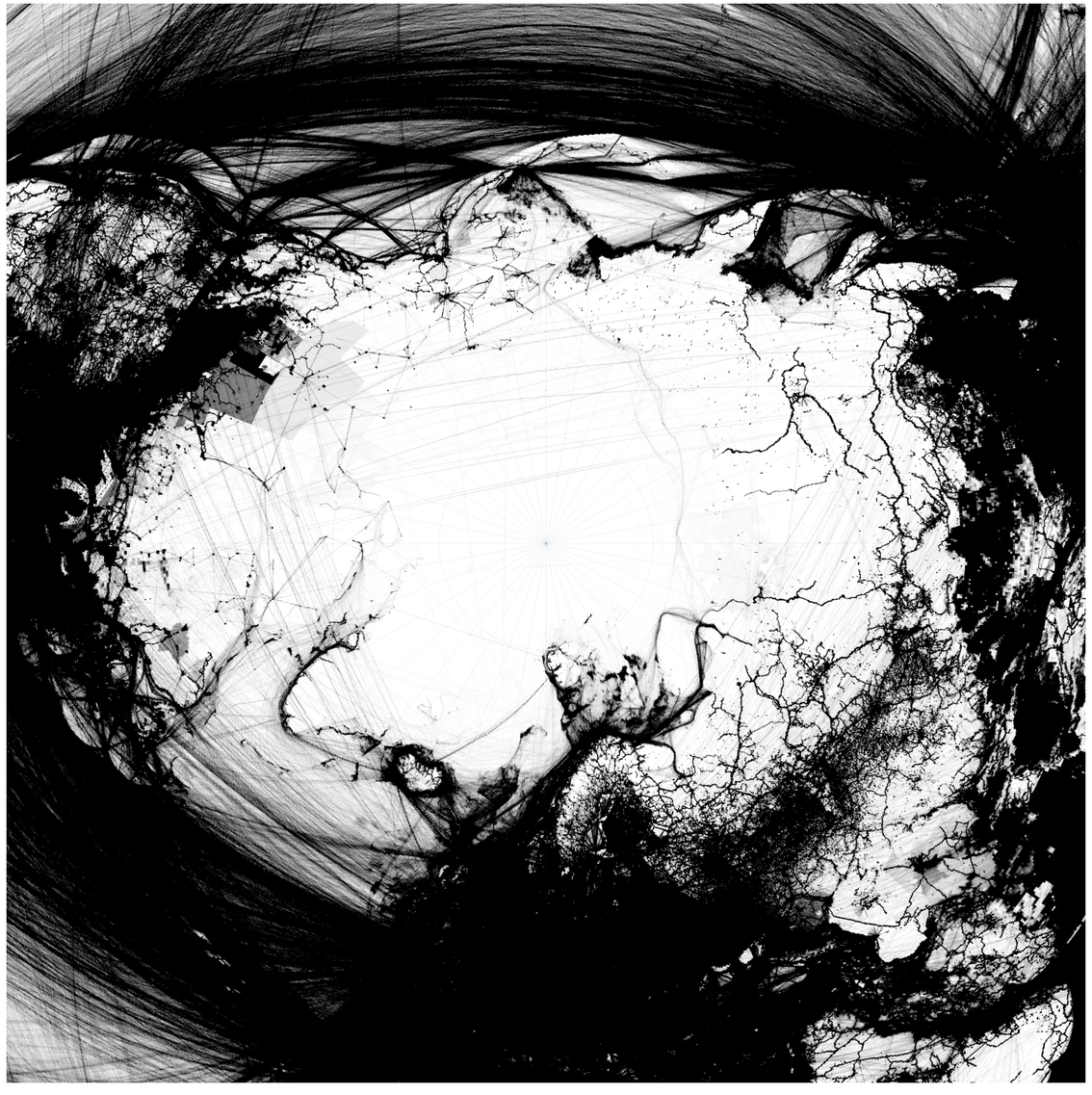
Mapping - Planetary

Annual Wind Speed Globally (2025)



Mapping - Circumpolar

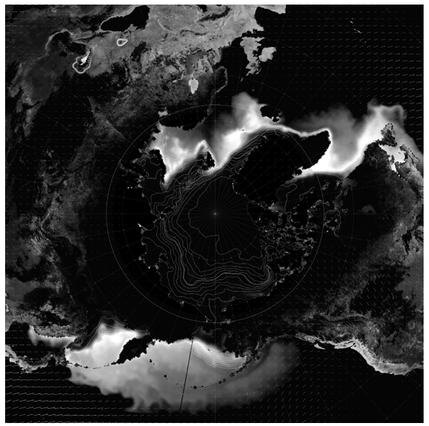
Black Carbon Emission (2021)



Mapping - Circumpolar

Land-Water-Air Monthly Condition (2025)

NDVI, Sea Temp (>273K), Wind Speed (m/s)



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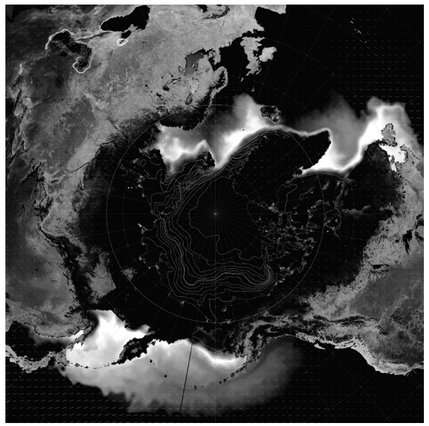

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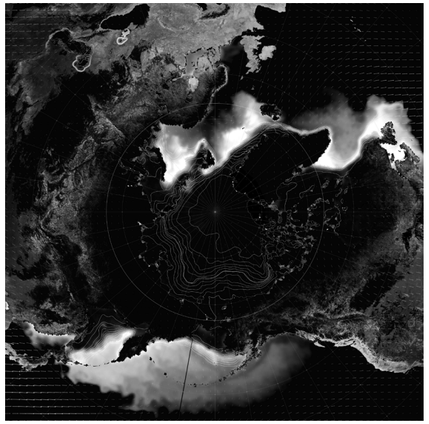

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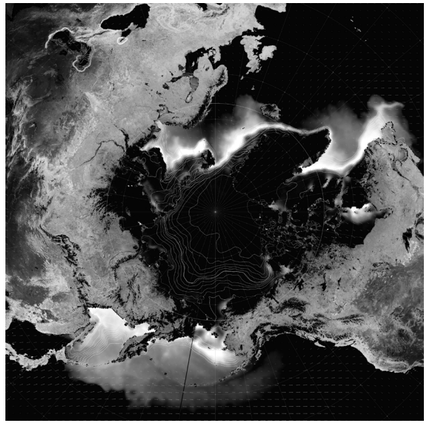

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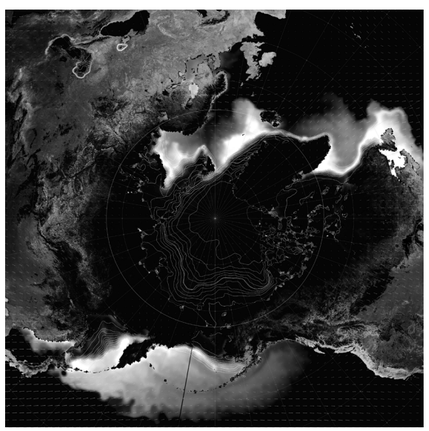

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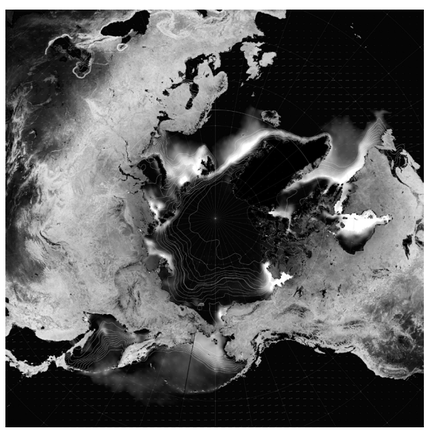

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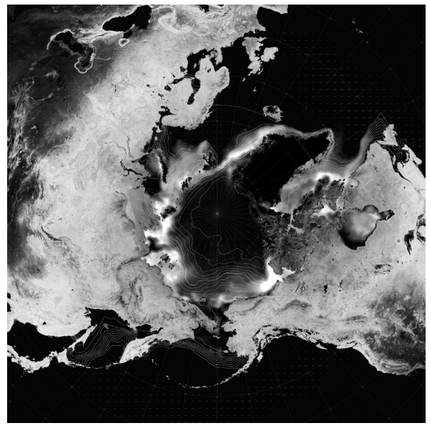

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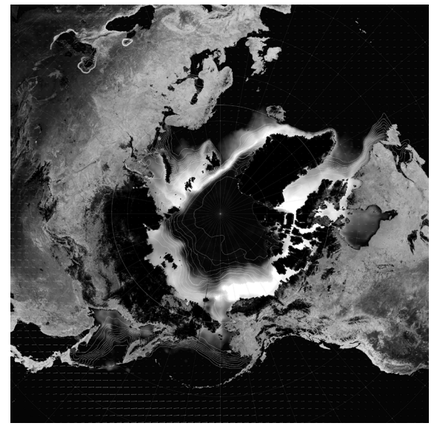

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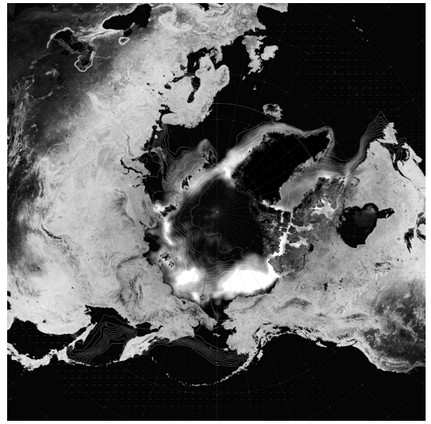

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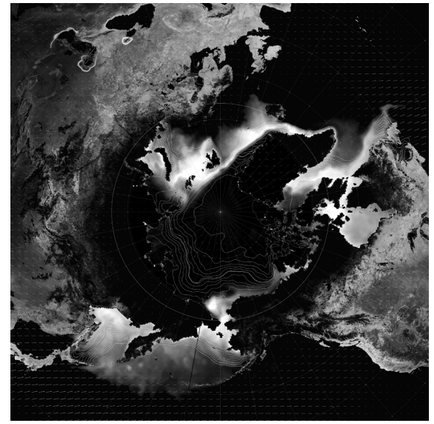

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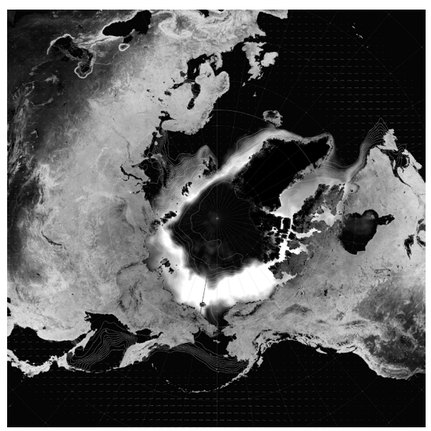

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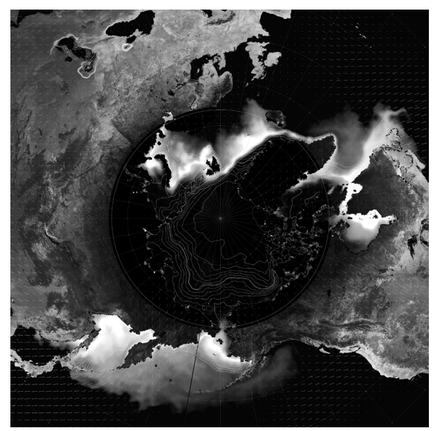
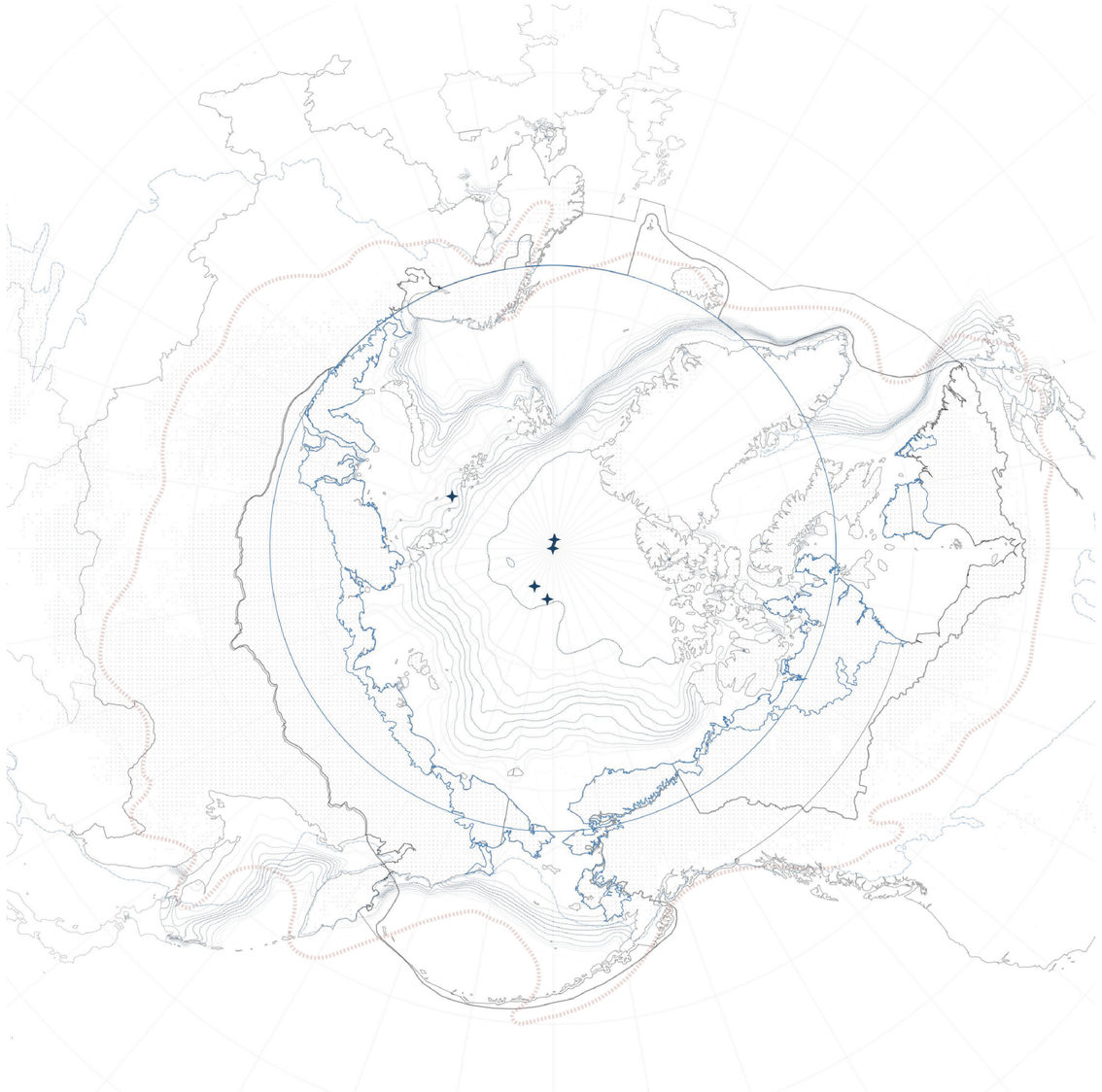


December

Mapping - Circumpolar

Hamelin's Definitions of North

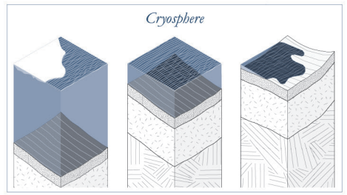
Biophyiscal deliminators and Hamelin's Red Northern Line



Mapping - Molecular

Biochemical Components of the Cryosphere

Matter

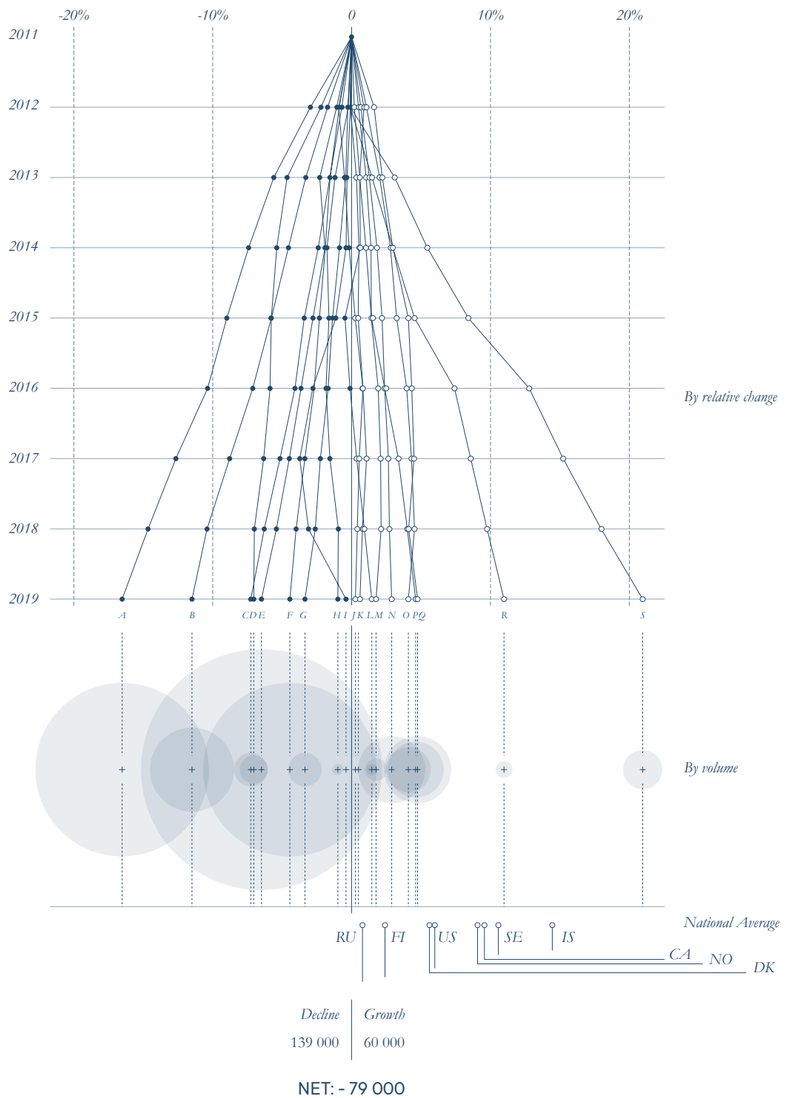


Cryospheric Thawing

- *Lead (Pb)*
- *Arsenic (As)*
- *Nickel (Ni)*
- *Mercury (Hg)*
- *Methane (CH_4)*
- *Chromium (Cr)*
- *Carbon Dioxide (CO_2)*
- *Magnanese (Mn)*
- *Carbon (C)*
- *Zinc (Zn)*
- *Copper (Cu)*
- *Nitrogen (N)*
- *Bacteria*
- *PEAS*
- *Microbes*
- *Virus*
- *Diseases*
- *Particulate Organic Matter (POM)*
- *Persistent Organic Pollutants (POP)*
- *Soil Organic Carbon (SOC)*
- *Dissolved Organic Carbon (DOC)*
- *Humic Acid*
- *Industrial Poly-chain Contaminants*

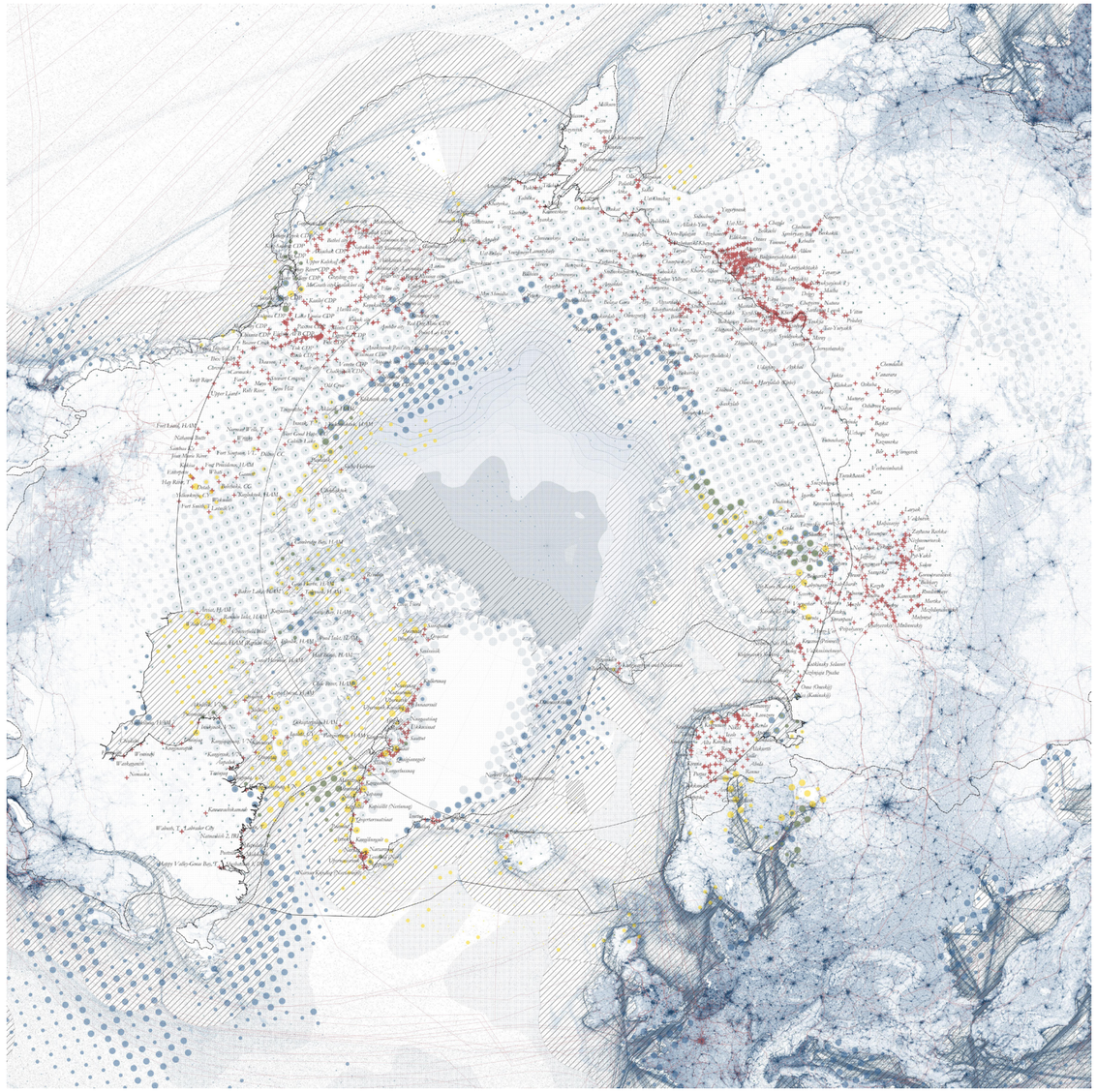
Historical Human Migration Trend

Local attractors and deflectors



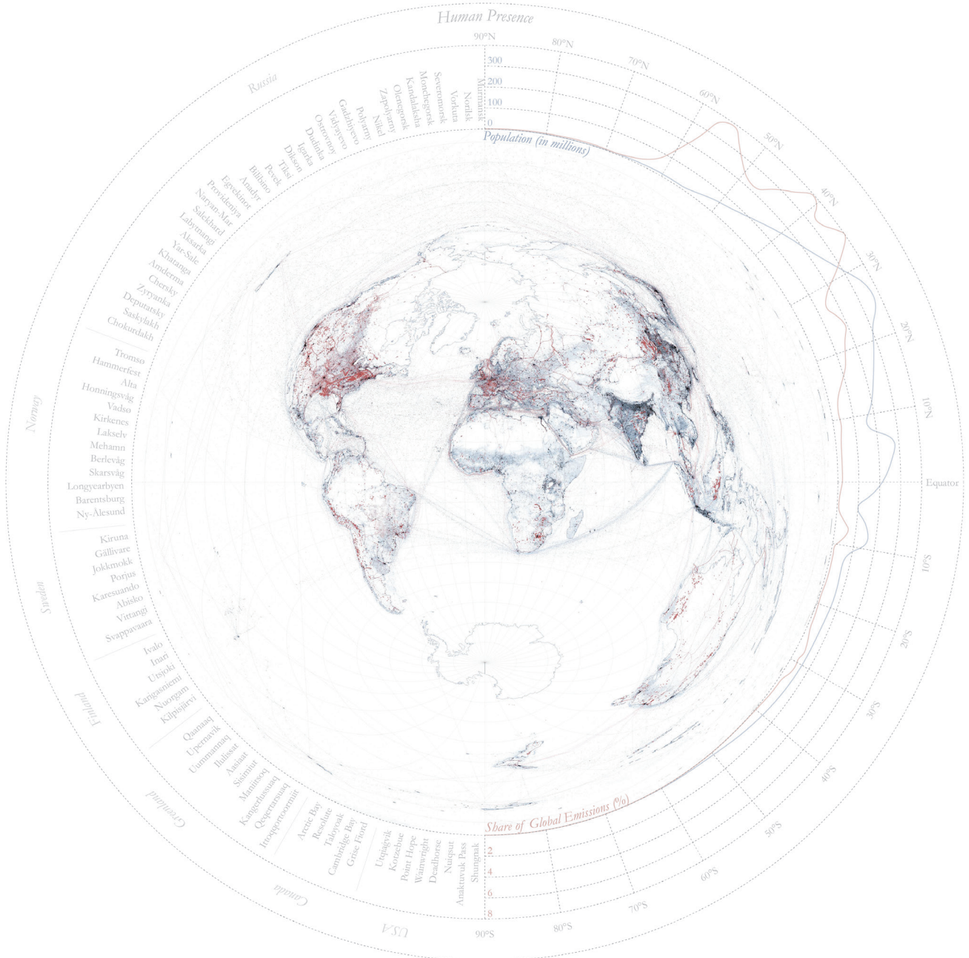
Preliminary Synthesis Map

Biophysical Alterations & Anthropogenic Presence



Anthroposphere

Flows & Conditions



Population Density

Hydrocarbon Infrastructure

Ports

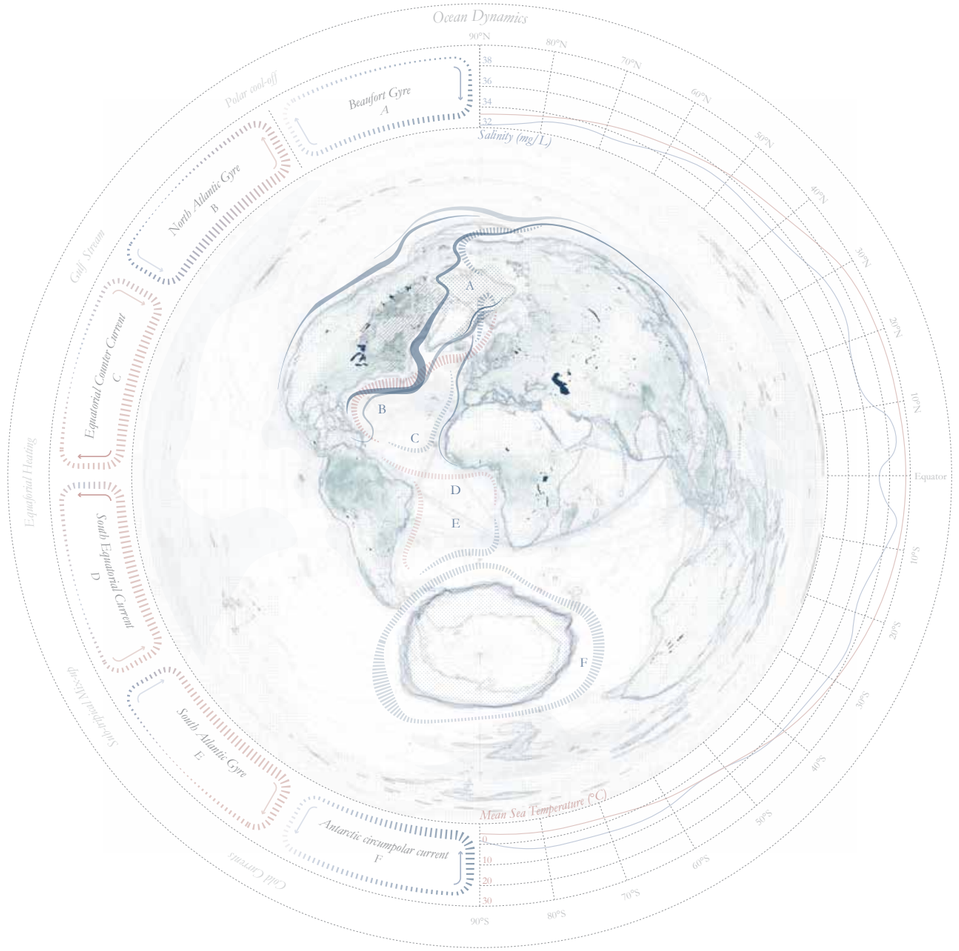
Mines

Subsea Cables

Global Shipping Density

Hydrosphere

Flows & Conditions



Seasonally Non-navigable Waters

Sensitive Marine Areas

Shipping Density

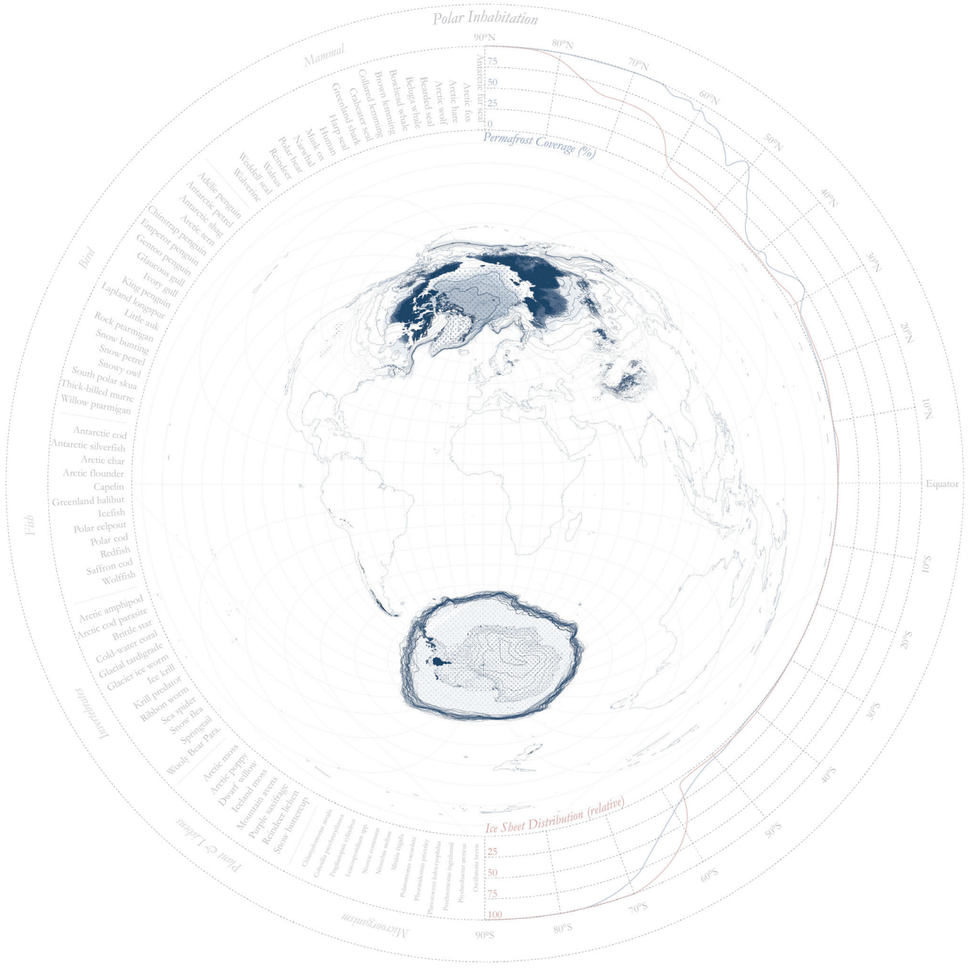
Cool Ocean Currents

Warm Ocean Currents

Main Maritime Migration Routes

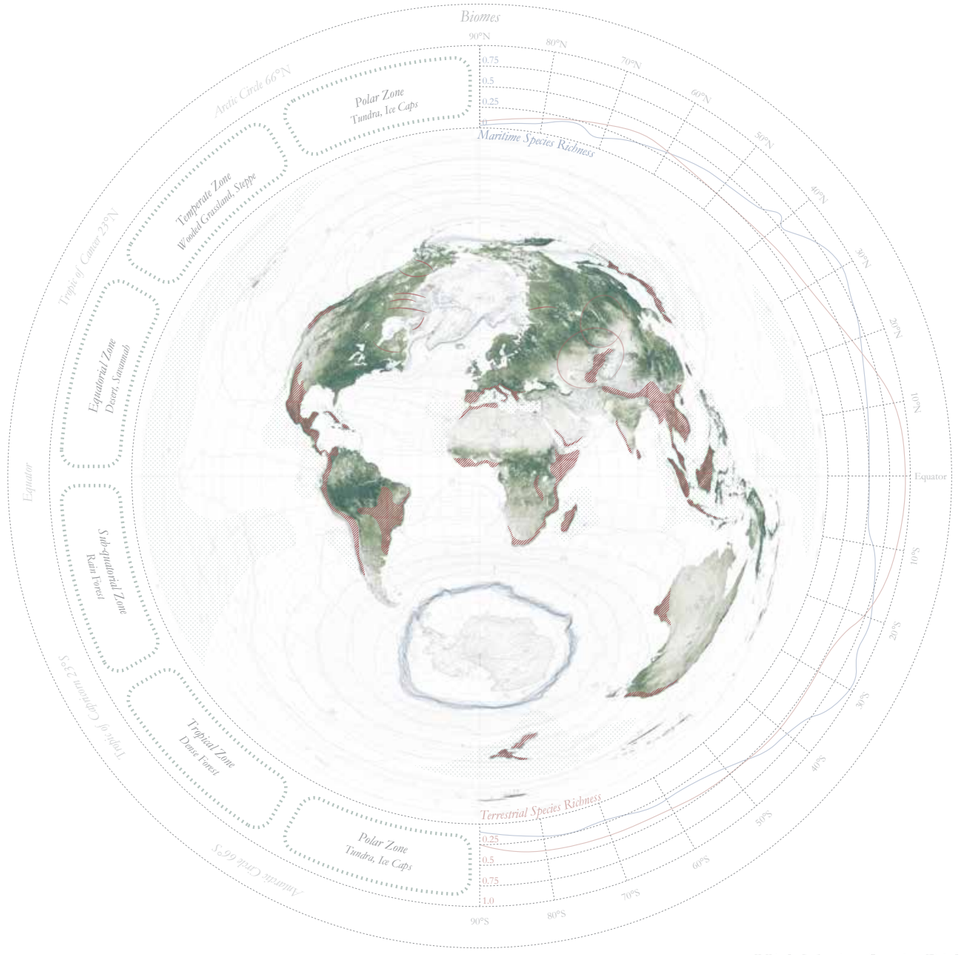
Cryosphere

Flows & Conditions



Preliminary Synthesis Map

Flows & Conditions



High Marine Species Richness

High Terrestrial Species Richness

Normalized Difference Vegetation Index

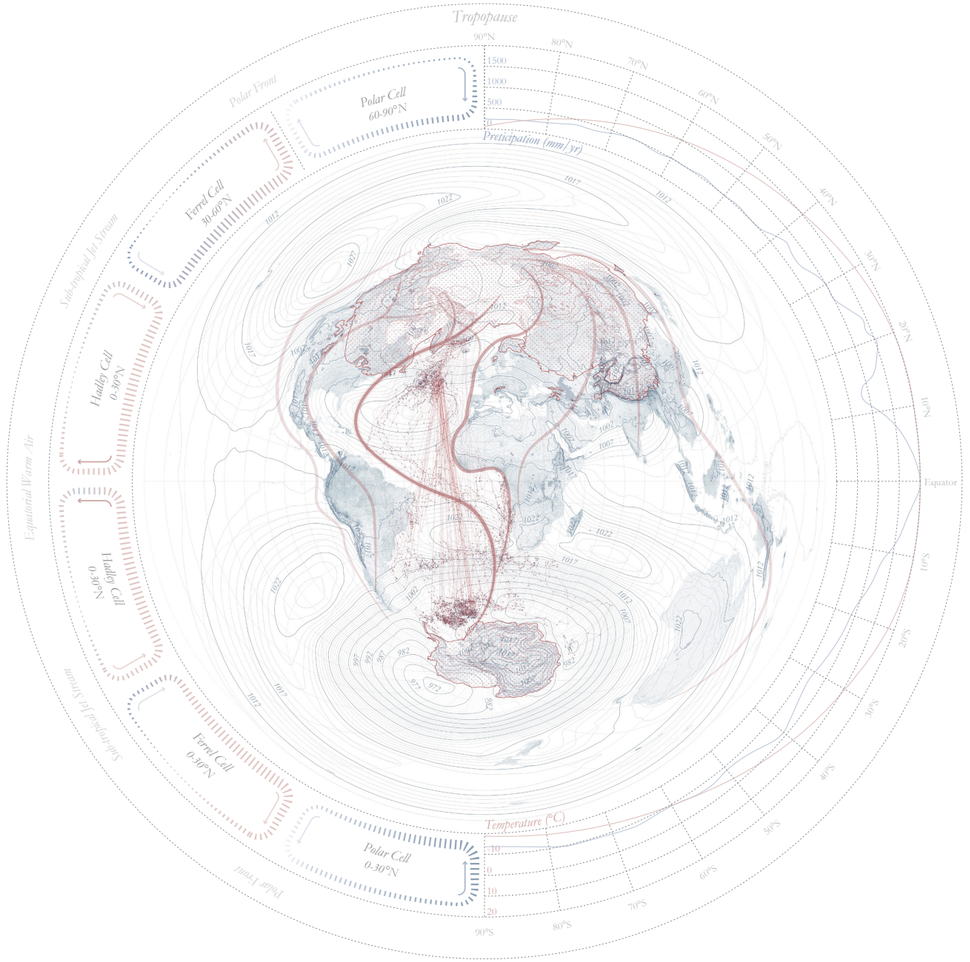
Main Terrestrial Migration Routes

Temperature (°C)

Ice Sheet Extent

Atmosphere

Flows & Conditions



Rivers & Lakes (humidity)

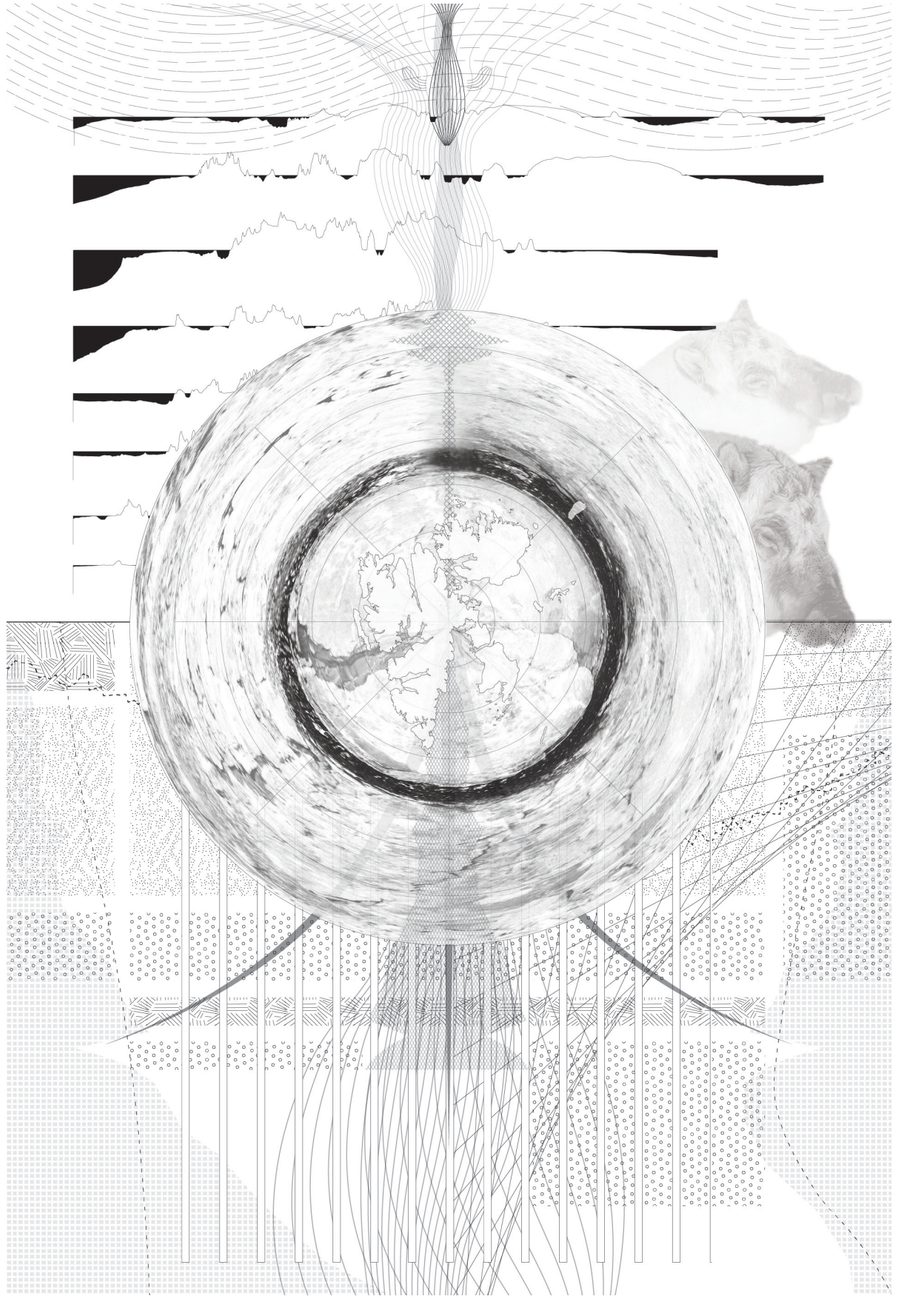
Air pressure (hPa)

Main Avian Migration Routes

Arctic Tern (Sterna paradisaea)

Preliminary Synthesis Drawing of Svalbard

Seasonality and temporality in the Arctic

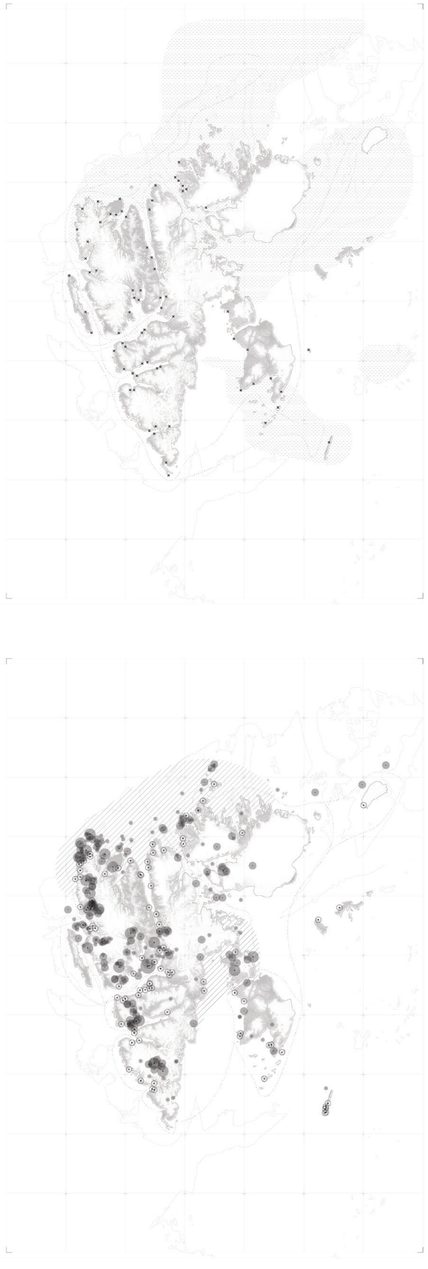


Mapping - Svalbard, Norway

Historical Developments & Periods

Spatial Uses of the Arctic archipelago of Svalbard

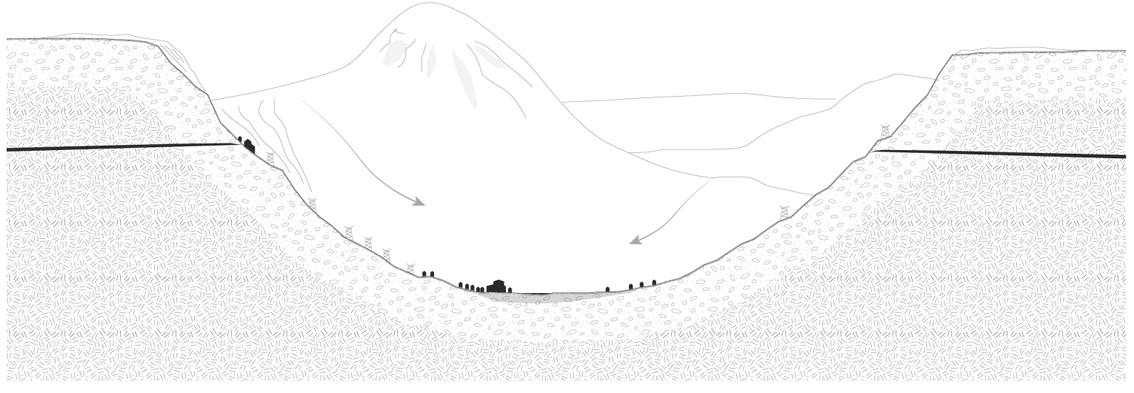




Mapping - Svalbard, Norway

Preliminary Synthesis Map

Biophysical Alterations & Anthropogenic Presence



Territoriality Through Matter in the Barents Sea

