Drifting Space and Unruly Velocities

More-than-Human Marine Spatial Planning in the Fram Strait

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Abstract

This visual essay explores the translation of complex environments through representations with attributes that are summarized as 'interdimensional'. These attributes are not elaborated yet, but the term emphasizes that these representations integrate different dimensions of experiencing and understanding various spatial scales and temporal perspectives. The process of producing these representations requires the landscape architect to encounter, investigate, and communicate life, materiality, and processes in an approach that appreciates attentiveness and creativity.

The representations discussed were developed in the context of a design studio at the University of Edinburgh that was elaborated and led by the author and situated within the Highland Boundary Fault Zone in Scotland. A studio collective composed of Master's students in Landscape Architecture over two years has been encouraged to traverse the fault zone, taking into account social, ecological, and geological fractures, as well as points of tension and upheaval.

Operating from within the 'critical zone', the provocation of the late Bruno Latour and his collaborators has been adopted: that working from this perspective is necessary to recognize that we humans are 'living among the living' (Société d'Objets Cartographiques [SOC] 2018). The design studio's approach encourages experimental drawing and making to develop 'ecologically explicit' landscape architecture—landscape interpretations and design propositions—that foreground and support more-than-human worlds.

Keywords

Arctic ocean, drifting, marine spatial planning, more-than-human, more-than-wet, oceanic urbanisation, sea ice.

DOI

https://doi.org/10.47982/spool.2025.2.06

Neither land nor open water, sea ice defies common binaries of solid and fluid. As climate change models predict an ice-free Arctic Ocean as early as the summer of 2030 (Kim et al., 2023), with an expected increase in petro-capitalist and shipping activity (Bennett et al., 2020), this once-frozen territory is undergoing irrevocable changes with potentially catastrophic consequences for the fragile Arctic marine ecosystems and the Indigenous communities whose livelihoods depend thereon. This contested oceanscape critically calls for alternative ways of understanding territory, urban fluxes, and oceanic spatial practice; the speculative project depicted within this essay explores sea ice as a vibrant material actor—unruly, drifting, and surprisingly gritty.

'The sea—a material, spatial, ecological, and recreational resource—is undoubtedly the site of one of this century's greatest planning challenges.' (Couling, 2022, p. 278)

As an increasingly instrumentalized, inhabited, and extracted space, the ocean is becoming an urban issue. A growing field of oceanic spatial scholars is researching the myriad ways in which the ocean functions as a designed, operationalized space (Couling, 2022; Couling & Hein, 2020; Edwards, 2019; Kiss, 2022). Across disciplines, the oceanscape is emerging as a spatial medium of anticolonial resistance and more-than-human reciprocity (e.g., the sonic oceanic explorations of AM Kanngieser and the artistic research trajectories of TBA21-Academy), calling for fluid seascapes to be included within the transdisciplinary intersection of environmental humanities and spatial research. The urban, by now exceeding what is usually perceived as 'the city', thus needs to be understood as extensively outspread on a planetary scale of production, labour, and resource extraction (Brenner & Katsikis, 2020) across both terrestrial and oceanic hinterlands. While the majority of research has focused on centrally located oceans like the Northern and Barents Seas, known for their histories of fishing, oil, and gas extraction (Couling, 2022), the question emerges of how to approach the increasing operationalization of the polar oceans, historically difficult to map but holding immense complexities of colonialism, encroaching infrastructures, and geopolitical conflicts.

Although the young discipline of marine spatial planning (MSP) has been gaining traction within the last decade, it has been criticized for failing to depart from land-based rules and logics, often resulting in rigid boundary-making and flat understandings of the ocean space (Couling & Hein, 2020; Bode & Yarina, 2020). Within MSP, traffic separation schemes (TSS) are commonly used to regulate and manage shipping traffic in places of high traffic intensity but have yet to be implemented in an Arctic context, where, up until now, the sea ice has acted as a natural barrier for most resource and shipping activities. Although more-than-human actors such as whale migration routes and ecologically significant areas are considered within most TSS, these schemes' dominant approach prioritizes efficiency and economic factors. Current Arctic territorial planning efforts include the International Convention for the Prevention of Pollution from Ships (MARPOL) (International Maritime Organization, 2022) and the International Agreement to Prevent Unregulated Fishing in the High Seas of the Central Arctic Ocean (Directorate-General for Maritime Affairs and Fisheries, 2021). The latter set a precedent for an unusually farsighted effort of multilateral collaboration addressing a potentially serious environmental problem long before the problem occurs, making feasible a comparable approach toward the increasing marine traffic disrupting the fragile ecosystems of the Arctic Ocean.

Questioning the dominant perceptions of ocean space, the extensive work of Kimberley Peters and Philip Steinberg has been invaluable, as it explores the notion of a 'more-than-wet' ontology and the myriad ways in which the ocean space exceeds both its materiality and the bounded space through which it is often cartographically portrayed (Peters, 2015; Peters & Brown, 2017; Peters et al., 2018; Peters & Steinberg, 2019; Steinberg & Peters, 2015). Peters and Steinberg position the more-than-wet ocean space as an arena for

reconceptualizing understandings of space, time, and movement, offering new perspectives beyond 'the static simplicity of the landed place' (Peters & Steinberg, 2019, p. 305).

With the unruly drifting of sea ice creating further spatial complications (Bay-Larsen, 2021; Peters & Steinberg, 2019; Shake et al., 2018; Steinberg & Kristoffersen, 2017), a more-than-wet ontological approach appears crucial within the polar territories to fully understand their complex materiality and connectedness to global environmental, geopolitical, and capitalist infrastructures. The difficulties with mapping the ever-changing sea ice have resulted in what Bode and Yarina define as 'cartographic silencing' (2020). Critiquing the limitations of conventional ocean space representation, they propose the notion of 'thick representations', which—instead of rigid boundaries and land-based planning logics—delves into the depth, movement, and temporal aspects of fluid space essential for a softer, more adaptive approach to marine spatial planning (Bode & Yarina, 2020).

Acknowledging sea ice as a drifting landscape and a material actor within the Arctic oceanscape, the project considers 'drifting' as a specific type of mobility (Peters, 2015). The project was developed through an explorative and comparative methodology across speculative scenario-building and entangled drawing material; a wide array of interdisciplinary and multimedia explorations became necessary to identify, through design methods, these possible oceanic futures. The multiscalar and multitemporal need to address sea ice as a landscape architectural matter made it essential for multiple drawings, model explorations, and speculations to exist, grow with, and inform each other; the drawings became active tools for thought. During this process, differing ways of rendering the oceanic space became necessary to analyze, visualize, and contextualize the vast amount of data available. Proposing drifting and mapping as formative design tools, the project explores a recent emergence of more-than-human stakeholders in Arctic marine spatial planning scenarios, which is geared toward a more dynamic, fluid understanding of the agency of sea ice.

FIGURE 1 *Drifting territories.* Following the sea ice from the Siberian ice nurseries to the melt passage of the Fram Strait, the project explores the Transpolar Drift as an integral piece of landscape infrastructure within the Arctic Ocean. Although shipping routes, sea ice, and ocean currents, as shown here, are territorial elements of the more expansive Arctic Ocean (AMSR2, 2023; Berkman et al., 2020; Eumetsat, 2023; GEBCO, 2023; SAMBR, 2017), they all convene in the Fram Strait, where a planning intervention could have a widespread effect on the marine ecosystem health on a larger scale.

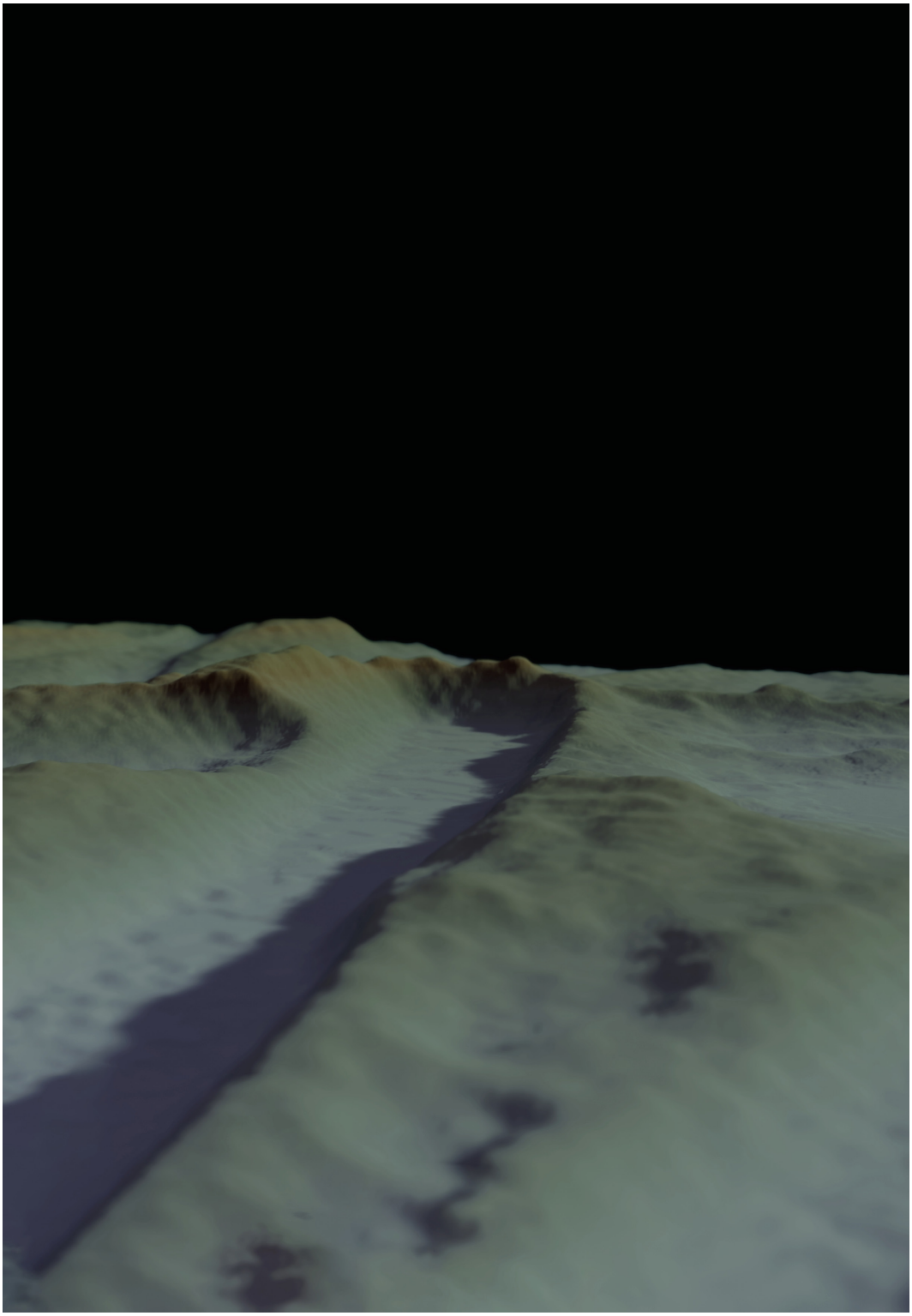

FIGURE 2 *Seafloor fieldwork.* Fieldwork was essential to relating to the ocean as a site, and I was fortunate to secure a spot on the Norwegian Institute for Marine Research's expedition into the Northern Barents Sea. Here, multibeam sonar scans conducted between Spitsbergen and Hopen Island (Norwegian Institute of Marine Research, 2023—rendered by the author) revealed an intricate landscape of iceberg scour markings and terrain modifications at 60 m depth, a testament to the lasting spatial imprint these drifting ice masses, however temporary they may seem, leave on the oceanscape through which they pass.

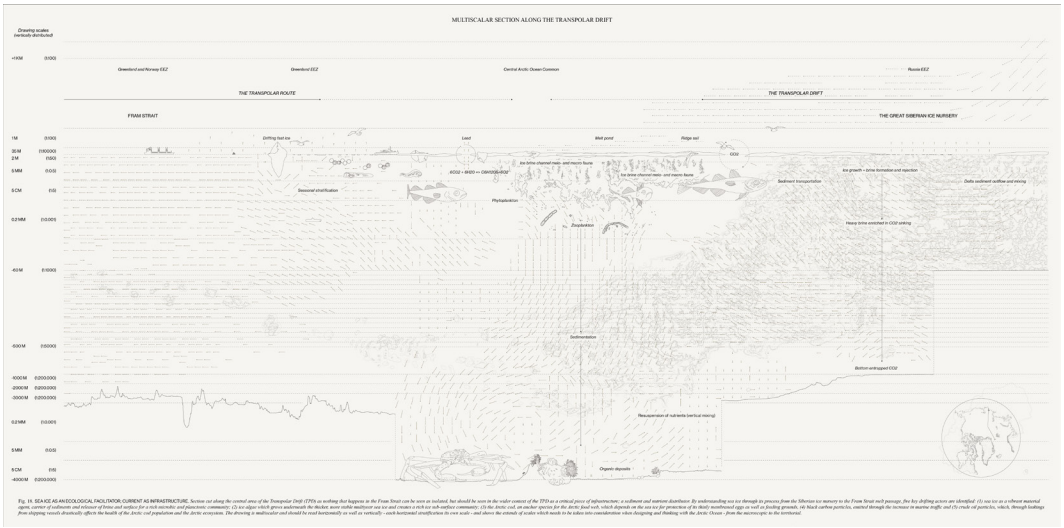

FIGURE 3 *Current as infrastructure: a multiscalar section along the Transpolar Drift.* Using the section as a critical tool to contextualize the scientific data, key drifting actors are identified: sea ice as a carrier of sediments, releaser of brine, and host for a rich microbial and planktonic community (Krumpen et al., 2019; Lannuzel et al., 2020); the Arctic cod, an anchor species for the Arctic food web (Huserbråten et al., 2019; Nahrgang et al., 2016); and marine traffic, with its noise pollution, black carbon, and crude oil particle emissions (Zhang, Q. et al., 2019).

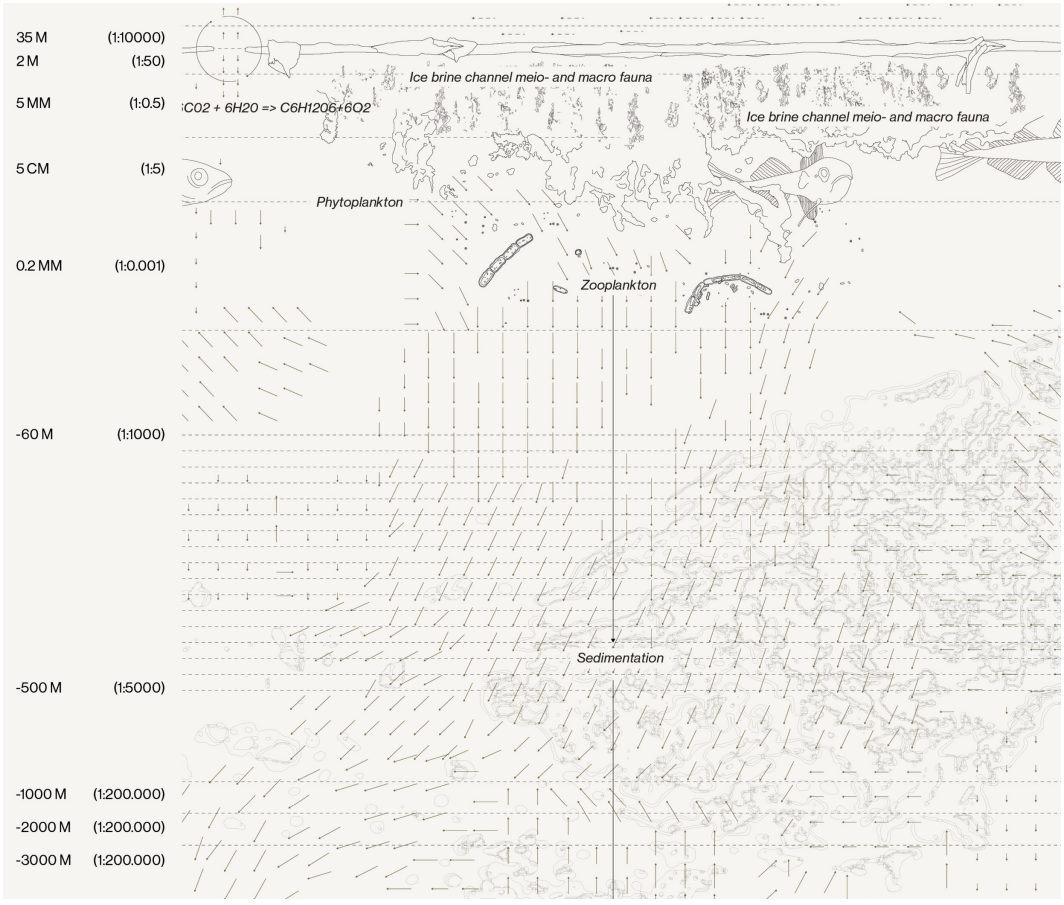

FIGURE 4 *Current as infrastructure: a multiscalar section along the Transpolar Drift (detail).* The section is multiscalar and is to be read horizontally and vertically. Each horizontal stratification is a scale of its own, stressing the variety of scales that need to be considered, from the microscopic to the territorial.

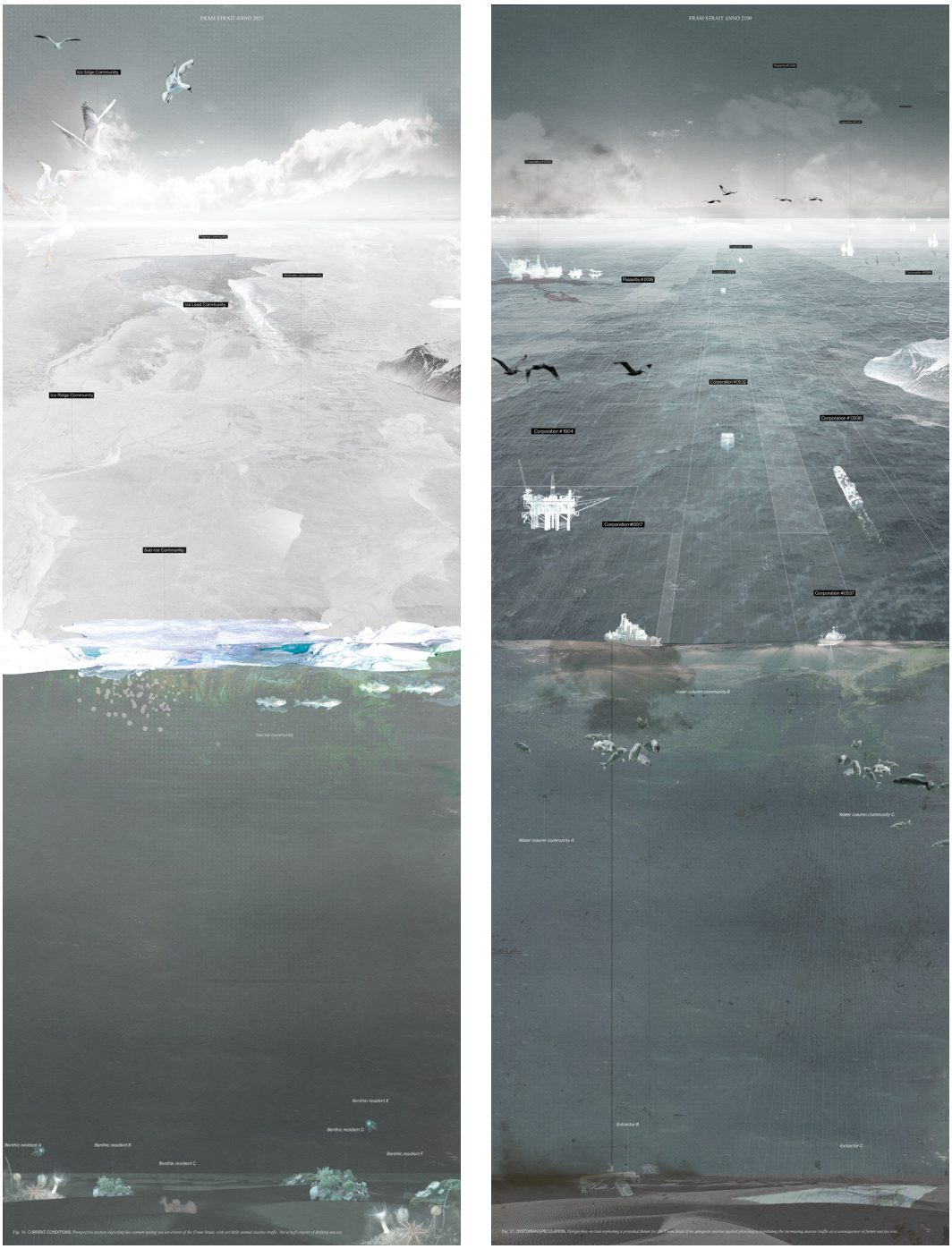

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FIGURE 5 *Current and future conditions, a speculative scenario.* The two speculative spatial depictions were crucial to concretize and materialize the possible futures within the specific context of the Fram Strait. To the left (1): a current depiction of the spring sea ice conditions in 2023 with little annual marine traffic but a high export of drifting sea ice. To the right (2): a dystopian speculative perspective section anno 2100, in which the ocean is densely partitioned, compartmentalized, and drawn out in rigid fields of ownership and nationality, the transpolar route now a major new maritime shipping highway.

FIGURE 6 *Field of negotiations: speculating in future Arctic territorial conditions through material movements.* As a contrasting model exercise accompanying the rigid research into marine traffic separation schemes and maritime law, a hands-on and dynamic simulation became a way to engage with the many frictions inherent in the territory.

FIGURE 7 *Model experimentation (video stills).* The model, consisting of a light table, a map, and various environmental and anthropogenic simulators (i.e., sand, washing powder, oil, liquid soap, black food colouring, vinegar, baking soda, brush, stick, spray bottle), furthermore became a way of explaining and entering into discussion with people to whom the subject was unfamiliar—a strange sort of board game in which, suddenly, the threat of an oil spill came to take a very material form.

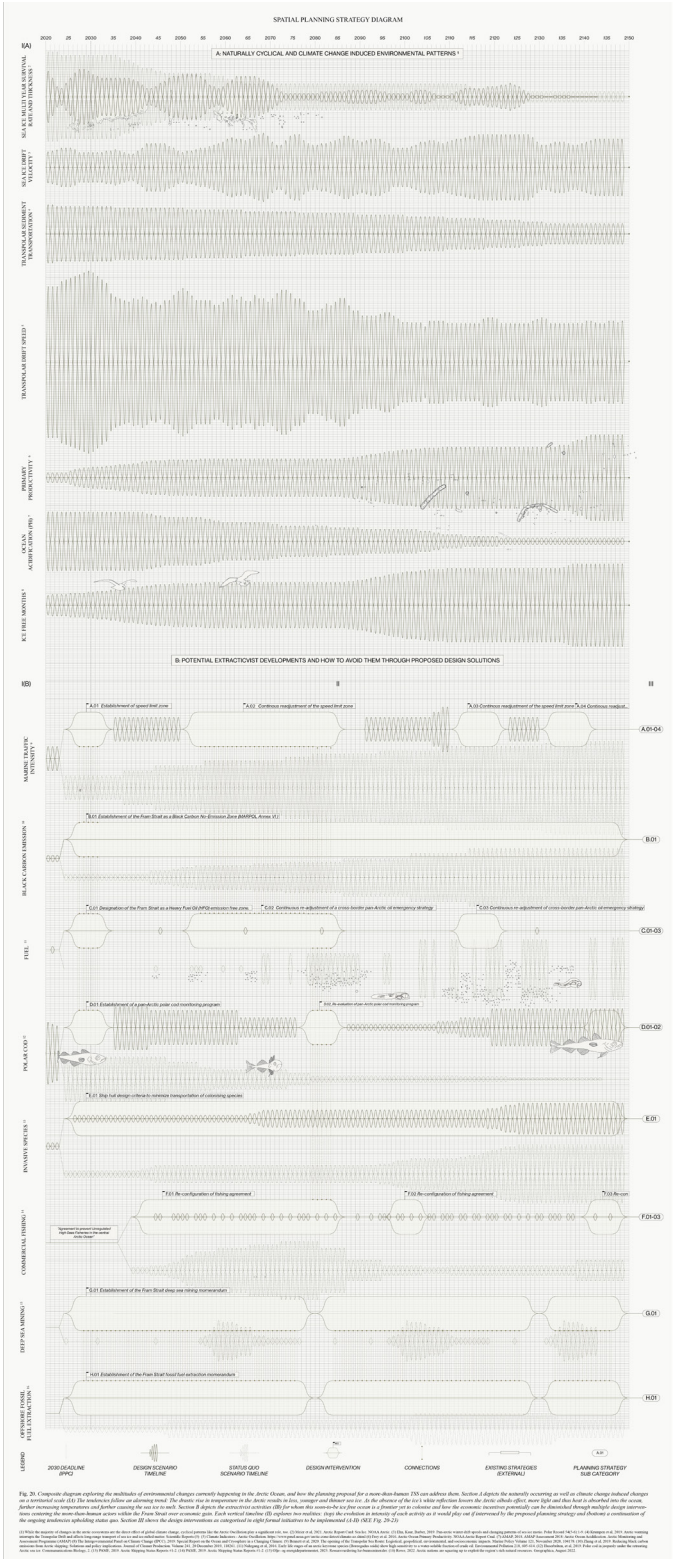

FIGURE 8 *Composite diagram.* Scientific data and modeled prognoses (2020–2150) were visually translated into a composite diagram exploring the multitudes of environmental changes in the Arctic Ocean. The diagram emerged as a crucial way of translating scientific data (AMAP, 2018; Bennett, 2020; Frey et al., 2016; Huserbråten et al., 2019; Kaur et al., 2019; Krumpen et al., 2019; Meier et al., 2021; Nahrgang et al., 2016; Climate Prediction Center, 2023; Oljedirektoratet, 2023; IPCC, 2019; PAME, 2019; Rowe, 2022; Zhang et al., 2019) into a differently readable visual language.

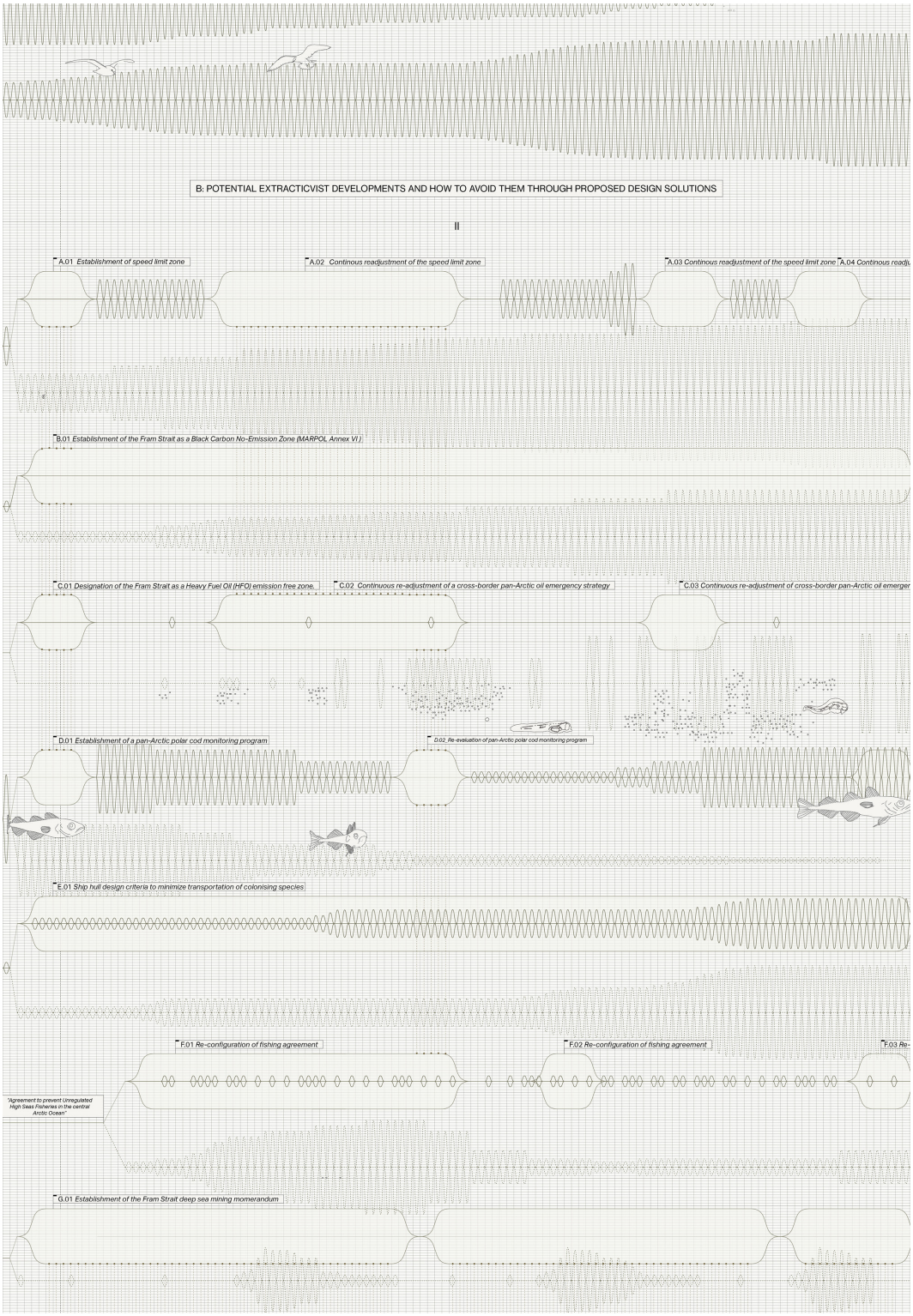

FIGURE 9 *Composite diagram (detail).* Mapping out multiple realities—one including the planning interferences and one maintaining a status quo—the drawing became instrumental in identifying potential key components and points of intervention for the planning proposal.

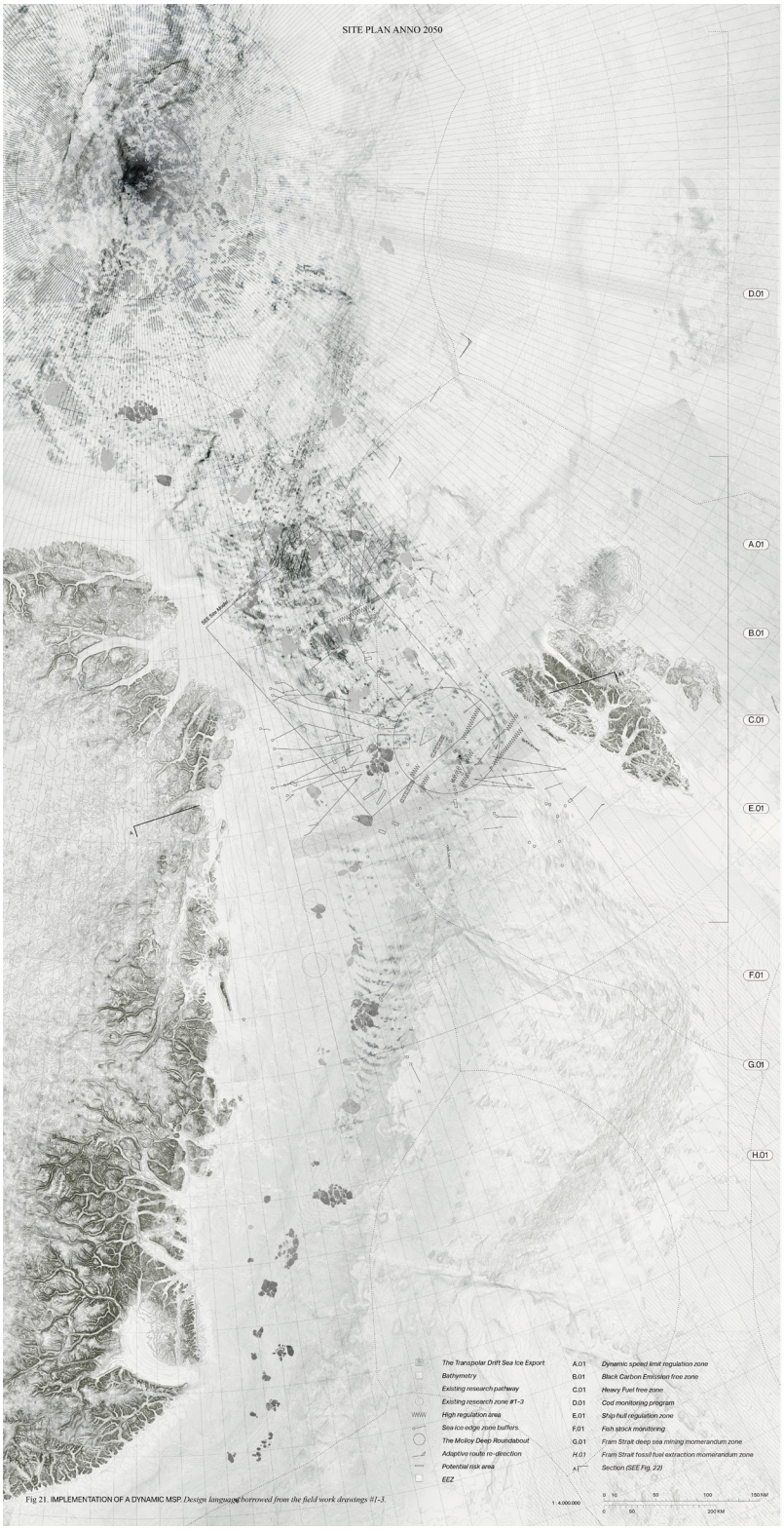

FIGURE 10 *A constantly shifting plan drawing.* Proposing a dynamically fluctuating marine spatial planning strategy for the Fram Strait, the project focused on creating a spatially responsive system between ice export levels, spawning periods, migration routes, fuel emission control, noise pollution, and ship hull criteria. Taking each passing actor, human or non-human, into account as 'drift passengers', the planning proposal aims to question the dominant anthropocentric hierarchy of marine spatial planning, proposing instead a design based on unruly viscosities.

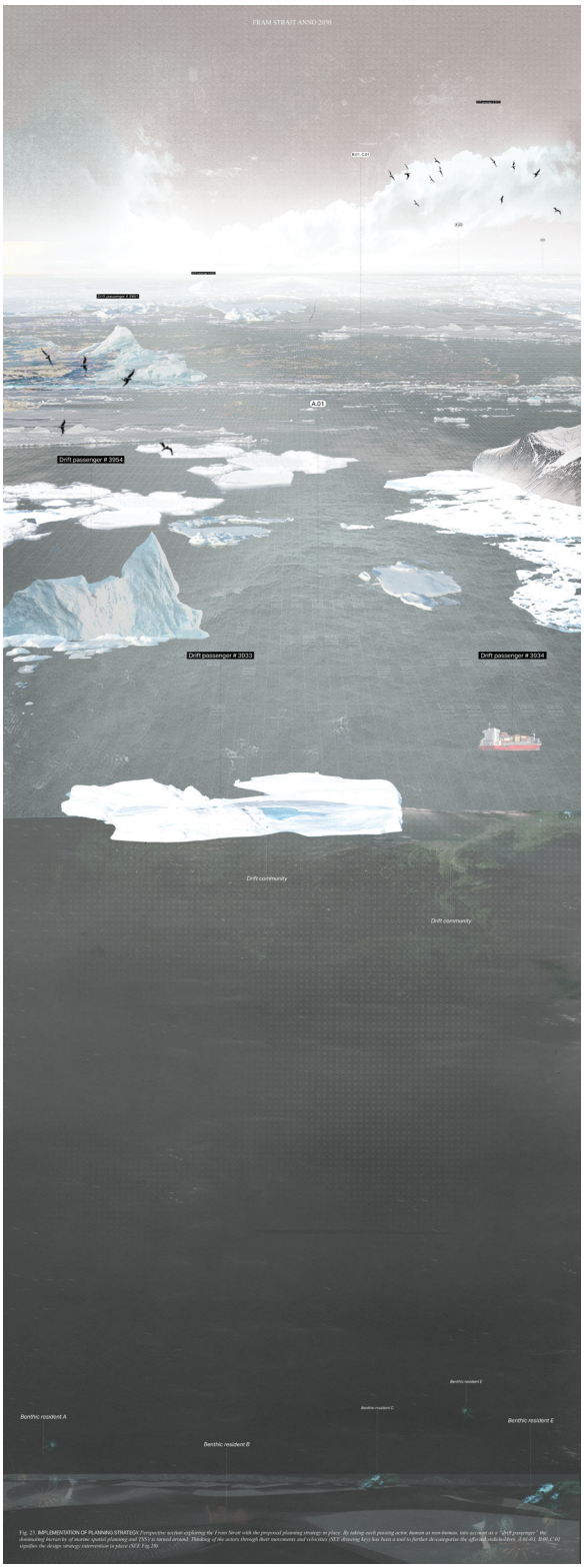

FIGURE 11 *Drifting stakeholders.* Finally, the perspective section explores the Fram Strait with the proposed planning strategy for 2050. Thinking with the actors through movement and viscosity became instrumental to further de-categorize the affected stakeholders: the notion of drifting thus became a crucial design tool for navigating the complexities of the Arctic environment, to plan with the unruliness of sea ice, and engage in less binary approaches to the frozen ocean space.

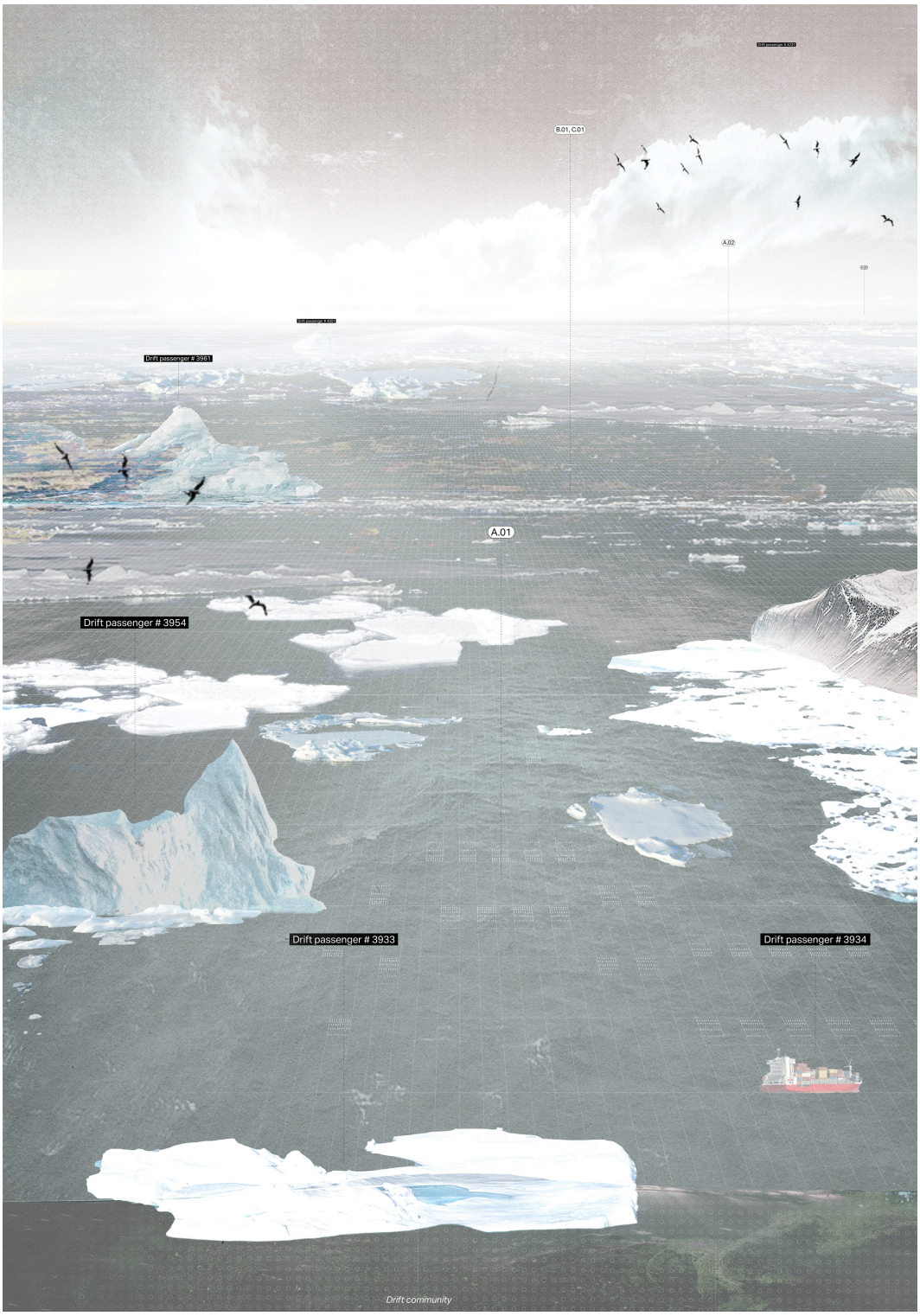

FIGURE 12 *Drifting stakeholders (detail).* While the role and agency of sea ice have been thoroughly researched throughout political and natural sciences, the project argues that a landscape architectural approach has the potential to unfold a more embodied understanding of the material agency of sea ice—here explored through an explorative marine spatial planning framework and interdisciplinary design methodology. The project frames the Transpolar Drift as an integral piece of landscape infrastructure and centres the agency of the drifting sea ice as a more-than-human stakeholder within the planning negotiations of a Fram Strait TSS.

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