

Shifting Infrastructures

MARIANNA DE COLA
University of Waterloo

LOLA SHEPPARD
University of Waterloo

ODE TO NEWFOUNDLAND

When blinding storm gusts fret thy shore, And wild waves lash thy strand, Thro' spindrift swirl and tempest roar, We love thee, wind-swept land.

"Though they are anthem-like, there is something indefinably sad about the words, resigned, regretful, as if Boyle imagined himself looking back from a time when Newfoundland had ceased to be. It is the sort of song you might write about a place as you were leaving it by boat, watching it slowly fade from view, a place you believed you would never see again. He was governor of Newfoundland for only a few years, so he must have written it in the knowledge that he was soon to leave."¹

SPATIAL HISTORY OF NEWFOUNDLAND

Historical Shifts

The Labrador Current, flowing southward within the North Atlantic meets the warmer Gulf Stream just southeast of Newfoundland. This meeting place occurs within the oceanic plateaus of the Grand Banks. The significant effects of this hydrological intersection of warm and cold waters off the Newfoundland coast are twofold. Above sea level, the Grand Banks plateau is one of the foggiest in the world. Below the surface, however, the warm and cold waters mingle to produce the best feeding grounds for North Atlantic Cod. The warmer waters heat the cooler; this conduction creates a circulation of water that result in the rising of nutrients from the ocean floor.³ Despite the menacing dan-

gers of fog and waves, the plentiful cod in these waters has attracted international fisheries for hundreds of years.

The Grand Banks of Newfoundland, which begin 500km offshore were created during the Ice Age, when glaciers scraped across the island, sweeping its topsoil into the surrounding waters. The glaciers stripped the land down to bedrock giving the island its name 'The Rock'. This produced the most fertile of the world's seas.⁴

Once these fishing grounds were discovered, presence, the exploitation, and the absence of the North Atlantic Cod affected the spatialization of each inlet, fjord, and inland settlement of the island. Seasonal inhabitation evolved to permanent dwellings as the race to this 'New Found Land' each season became a competitive seasonal venture.⁵

As the population transitioned from solely seasonal inhabitation to a society that withstood the harsh winters, a sporadic network of permanent communities evolved. In order to maximize access to the coastline and extraction of the invaluable cod, dispersed, isolated coastal settlements were key.⁶ A leapfrog effect resulted and the "spatially segregated" populations spotted all the coasts of Newfoundland.⁷ As families grew and sons had their own sons, a move to the next sheltered fishing ground was a requirement. A decentralized population was needed to manage a healthy exploitation of the resources in the water.

Connected Ecosystems

The process of preserving fish had not evolved for 500 years.⁸ The traditional methods required the codfish to be soaked in brine and left in the open air to dry. A community's wharf would usually be built up with stages that displayed cod fillets drying. The catches were so mercilessly saturated with salt that they solidified to rival the strength of a wooden plank.⁹

Clarence Birdseye, while living in the cold and dry environment of Labrador, developed a drying and freezing process in the 1800s.¹⁰ Soon after, fishing vessels contained freezing units to initiate the process before the catch arrived to land.¹¹ Longer fishing hauls were now possible. This, coupled with the popularity of fish sticks and McDonald's as a huge consumer of the frozen product, completely changed the fishing economy. Fish plants no longer had to be in areas close to the source. Unsalted fish consumption increased worldwide.

Bottom dragging developed as one of the most efficient ways to commercially fish. Scientists have argued for years that the damage done by this abrasive method is detrimental to ocean ecologies. But their proclamations went, and still primarily go, ignored.¹² Aquatic flora and fauna have been obliterated within these scars of the Grand Banks. The by-catches from bottom dragging are high, and the effects on the ocean's surface are, without question, consequential.¹³

These technological advancements, both on the vessels and on land, had significant effects within the physical structure of Newfoundland's population. With more fish being caught with stronger nets, the possibility of longer hauls, and fewer workers needed on board fishing vessels, the economic foundation of Newfoundland started to crumble.¹⁴

Centralizing Populations

The unsteady economy of the 1930s hit Newfoundland hard. Still part of England, it was relegated to a geographically, economically marginal state. As a predominantly single resource economy, the island's heavy dependence on cod left it to struggle. Joseph Smallwood, a leading political figure, worked on diversifying the economy and pushed towards the joining of Canada. Canadians had recognized the importance of Newfoundland's geographical location and the threats that the United States posed. Russia had already handed Alaska over to the Americans and Canada recognized the importance of the fishing grounds surrounding this island. They offered

Newfoundlanders generous financial security.¹⁵ Tightly contested, in March of 1949 Confederation with Canada won the popular vote.¹⁶

Canada's tenth province hoped to leverage the mainland to aid in Newfoundland's modernization and economic reinforcement. Smallwood had unbridled faith that infrastructure, and connectivity could lead to a more centralized population and a more modernized society.¹⁷ During these economically depressed years, the scattered outport communities of Newfoundland could barely survive. The isolation of these fishing villages left these communities significantly behind the rest of Canada in standard of living and level of services, yet the modernization of the fishery industry made it difficult for them to stay. Their original strategy of inhabiting the coast proved problematic in their need to modernize. Energy and services, was a difficult resource to provide to scattered and isolated communities. As a solution, the centralization of populations was promoted, with the construction of the Trans Canada Highway facilitating this movement.

Joey Smallwood conducted many economic studies on the results of a centralization program within the province of Newfoundland. Many of the communities had citizens that were either living in impoverished conditions, or simply left the province to find work on the mainland. The reports studied and assessed all the scattered settlements within Newfoundland, and labeled each as a potential "growth centre" or a community with "no great future". Among these studies, a classification system labeled each community based on isolation brackets. A gradient from 1 to 10 (with 10 being the most isolated) aided in these classifications. Access



Figure 1: Moving Houses. Source: © 2003 - 2005 Maritime History Archive, Memorial University

to roads, highways, mail, and education were considered less isolated and more ideal.¹⁸

Spanning two decades from the 1950s to the 1970s, approximately 300 communities were abandoned and many more depopulated.¹⁹ These people received government assistance to move to the designated "growth centres" so a mass reorganization of the population occurred.²⁰ People transferred their families, and often literally floated their homes to new locations, in search of a better, more modern, and centralized lifestyle.

The Moratorium and Out-migration

In July of 1992, John Crosbie, Minister of Fisheries and Oceans Canada, announced the commencement of the Northern Cod Moratorium in St. John's, the capital of Newfoundland. Just 3 years prior to his announcement, he had attempted to trivialize any suspicions of a moratorium, although many of the inshore fishermen knew that the decline in stocks had reached critical levels.²¹ Unfortunately, this temporary prohibition became permanent as cod stocks have failed to ever bounce back to a healthy state. That single day in July resulted in the loss of 44,000 jobs for fishermen in the province of Newfoundland alone.²²

Two years later, the moratorium was still in full and dramatic effect. A man from Notre Dame Bay, named Frank McCarthy, was charged for catching cod for his own table. It was the first charge given to a Newfoundlander for non-commercial cod fishing.²³ The moratorium and eventual strict quotas proved to be very stringent in the decades to follow. There had been many years prior to the moratorium that the inshore fishermen of Newfoundland perceived the early signals of an unhealthy cod stock. Many reports to the government's scientists were communicated as early as the 1970s, but the offshore fishermen were catching their quotas.²⁴ A dismissal of these warnings proved detrimental. Unfortunately, the insatiable hunger of man and the thorough execution of the newest technologies led to the decline. When the cod fishery died, the whole economy for Newfoundland died.

Despite the clear issues behind the health of our ocean's ecologies, sonar testing for the offshore oil-rig called Hibernia ensued. These evaluations and development began in 1989 and some believe that the disturbances this caused upon the continental shelf did not help the distressed condition of fish ecologies.²⁵ Currently Hibernia sits 300km off the eastern coast of Newfoundland. It employs 800 men and operates with 3-week intervals.²⁶ Since the opening of Hibernia two other oil-rigs extract oil

from the Grand Banks. Offshore oil was the savior of Newfoundland's economy.

Realistically, the ways in which the seas are being managed are not conducive to a possible restoration of fish stocks. With Newfoundland now a Have province, ineffective restrictions on fishing and licenses, and bottom dragging in order to hunt crab, the hope to restore the sea's ecosystems has virtually evaporated.

WATERSCAPE

South Coast of Newfoundland

The southern coast is only accessible by boat. The extremely rough and mountainous topography makes for a difficult place to consolidate and modernize. Between the 400km of coast, from Port Aux Basques to Harbour Breton, a team of three ferries runs a very limited schedule between communities. These places (each commonly consisting of 100 people or less)²⁷ withstood the effects of the resettlement program, and are making due with their weekly post, food, and diesel deliveries. High waves during the harsh winters make this movement within and beyond the coast quite difficult.

Territorialization of the Seas

The pattern of the island's settlements has been of gradual occupation of the coastline, with few inland settlements and few roads. The island has, in a sense, turned itself 'inside out', oriented towards the sea as its territory.

Into the post world war years, advancement in fishing technologies changed the way fishing was carried out. With faster boats, better nets, and ocean floor draggers each vessel had very successful catches. It became necessary for nations to secure their fishing grounds to ensure that international vessels would not overexploit a resource that was not their own.

Concurrently, the offshore oil search sparked interest in the surfaces beyond land. In 1945 President Harry Truman wanted to protect the United States' offshore oil production. He declared the right of the United States to control resources on its own continental shelf. As most commercial fishing took place within these areas, the consequences of this idea of ownership of the seas were tremendous.²⁸ Nations now extended out beyond the basic extents of the coast. In the meantime the Cod Wars were fought between the British and Iceland. In 1976, Iceland's 200-mile limit secured affirmation and soon after,

90% of the world's fishing grounds were claimed by a nation's 200-mile zone.²⁹

One can imagine the territory of Newfoundland existing in the realm between coast and the extents of the continental shelf.

Leaving Grand Bruit

I've been to a place that no longer is; The sun battled the greyness that early July day I went. The result: clouds shone with a titanium glow, and the ripples on the harbour were almost blinding. The peaceful reflection of the houses nestled within the rocky landscape was disrupted by the arrival of the loud and clumsy ferry.

Residents watched as the ferry gracelessly bumped the side of the dock and helped tie it to the edges. Curious to see who the unknown visitors were on the ferry, they shyly peeked and then pretended not to notice. Their delight was soon overcome by



Figure 2: Grand Bruit Relocation: Photo by Author

the anxiety of the inability able to fit all of their belongings and themselves aboard. Slowly and strategically the onboard crane lifted their plastic wrapped washers, dryers, bits and pieces onto the ferry. This seemed to be just another day of a year long relocating process.

Grand Bruit is located on the southern coast of Newfoundland in between Port Aux Basque and Burgeo. On Monday, Wednesday, and Friday, one can reach Grand Bruit after an hour and fifteen minutes from La Poile. And after three hours on Tuesday and Thursday from Burgeo. The significance of mobility in these isolated communities is considerable. There is one true lifeline for these remote communities: access. And Grand Bruit had lost its access.

Difficult for the province to provide basic services to this barely populated isolated community, it is more economical for the province to buy out each household. Based on calculations, fifteen years after Grand Bruit's relocation, the government will have recovered any costs involved.³⁰

In the case that a fisherman wants to return to fish in season, they are required to lease their property back from the government for a small annual cost. Aesthetic maintenance buildings are prohibited by law.

Topography

The topography of the Southern coast of Newfoundland is breathtaking. The shoreline varies from piercingly steep inlets and harbours to rocks peeking above the surface of the ocean. The inability to connect this portion of the island is because of this very topography. Building with such tremendous topography and solid rock is difficult, if not impossible.

Bathymetry

The bathymetry is as astonishing as its mirrored topography. The depth of the ocean and its steepness allowed for easy access into the waters and to the fish. The ocean reaches depths of greater than 200 metres just 60km off the coast. This made the site, for several reasons, ideal for the offshore fleet to fish and harbour. The scarred surface off the southern shore posed an ideal location for renewal. The site is the floor of the Atlantic Ocean.

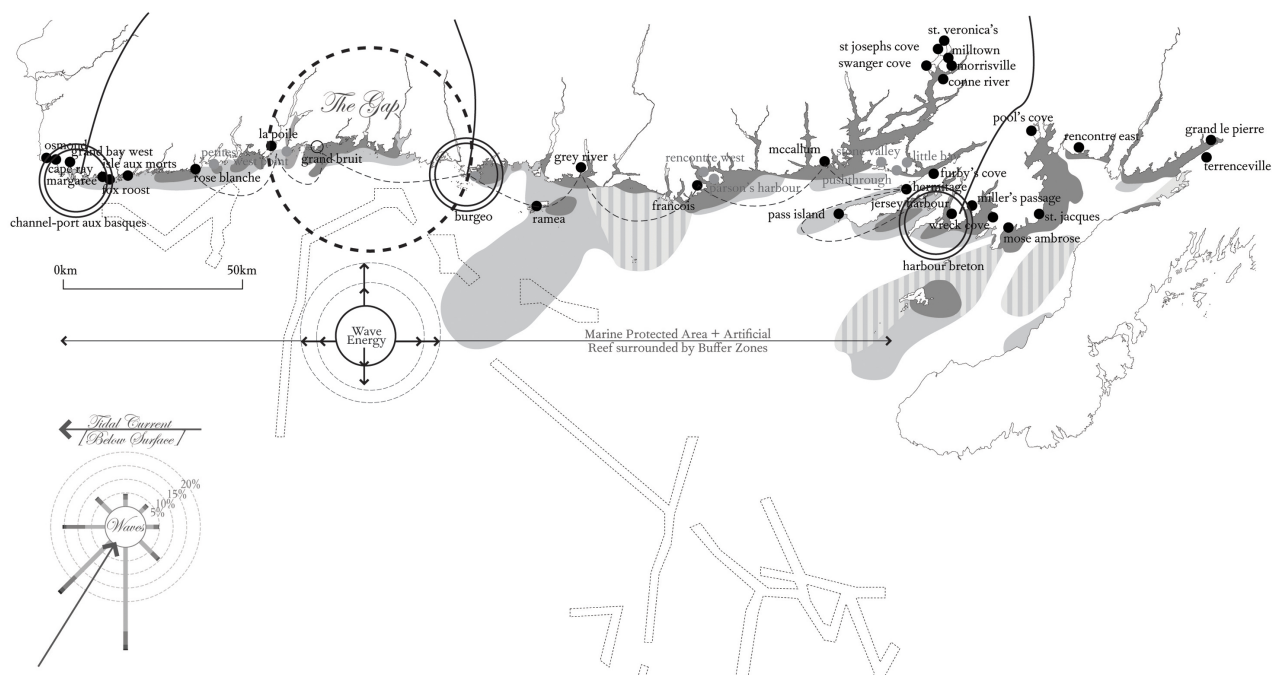


Figure 3: Diagram of Southern Coast. Created by Author

Waves

In the fall, the waves on the southern coast can become so violent that when they make contact with the hard granite a spectacle of 50-foot high burst of salt-water results. There is

so much energy in the waves. The sea can offer so much to these edge dwelling communities. Waves can reach an impressive 10 metres or more.

The southern waters, in contrast to the north, east, and west of the island, are free of ice in the winters. The spring and summer bring little to no icebergs as the island acts as a shield from the pieces from northern waters. The tidal current flows from east to west and the waves develop from the southwest.³¹ The largest waves are seen in the fall and winter, when the temperature of the air and water differ. The winter months are ideal for wave energy harnessing.

FLEXIBLE INFRASTRUCTURE:

"To prevent slipping, a knot depends on friction, and to provide friction, there must be pressure of some sort. This pressure and the place within the knot where it occurs is called the nip. The security of a knot seems to depend solely on its nip."³²

The intervention grasps the pieces of the island's infrastructure, history, resources, and politics that have dominated the collective psyche over the last 500 years. These are subverted into elements that can be utilized in a positive transformation of the landscape/waterscape that will encourage gradual physical restoration of the southern coast. The physical interpretation of these elements reconciles the tension between the political views on resources as well as the nostalgic attachments associated with the Atlantic cod fishermen. The initial site sits offshore the recently abandoned Grand Bruit. This is the theoretical nip; The point of most tension along the southern coast.

Newfoundland has always relied heavily on a single industry for their economic strength. It was true in the past with cod, and now with the discovery of oil. Similar to the consequences of the fishery, the oil will provide another 'boom and bust' economic circumstance. The project seeks to identify a new industry to fuse functions and open the possibility of a dynamic economy. The design seeks to restore the sea, rather than destroy it. The creation of offshore devices potentially opens up a possibility of another public realm, supports the fishing industry, and could provide points for monitoring the conditions of the aquatic domain.

The regenerative artifact is conceptually and physically split into two parts. The upper portion relates to the energy needs of the population on land. It harnesses and stores the liveliness of the waves. The foundations will respond to the need to regenerate the destroyed benthic surface of the ocean. The form responds to the direction of waves and current to optimize wave harnessing and the collection of nutrient deposits.



Figure 4: Wave Energy/Artificial Reef: Created by Author

[Re]Generation

The design couples infrastructural uses to aid in the regeneration of the human population as well as the aquatic population, while returning the focus of Newfoundlanders back to the sea. The two ecologies (one of the land and one of the sea) have a direct relationship to each other. The ecological health of the benthic surface has immediate effects on the health of the populations on the land. The designed infrastructure subtly layers the restorative pieces and serves as a constant reminder of what was and what might become the cultural environment. With a softer, more responsive infrastructural system that seeks to link the history of Newfoundland's coastal settlements back to their ecological, cultural and economic ties to the sea.

The intervention takes the form of a shifting wave energy island (to offset the cost of the current diesel energy system) whose tethers to the ocean floor serve to revitalize the benthic surface of the Atlantic Ocean. In both protecting the area from fishing³³ as well as a designed artificial reef [anchors] will help revitalize the ocean floor that has been stripped by commercial trawlers in search of Cod. The wave energy system will be strategically located where populations gather and where energy is in demand. Simultaneously, the damaged benthic surface areas will be a factor in location of deployment. As the construction of this harness and restorative system may be disruptive, the scarred ocean floor provides an ideal place to initiate construction.

The migration of Newfoundlanders is based on fishing season and economy and this will inform a dynamic network of locations offshore, for locating the wave harness and artificial reef. Often a place onshore may be temporarily inhabited. As the system is needed elsewhere it is the intention of the speculative design to provide a dismantling mechanism to allow a flexibility in the place of harness and restoration. The harness can be unfastened from its nutrient filled foundations and drawn to the area in demand. This shifting infrastructure is meant to relate to the demand and the need. It is intended to shift, multiply, and hibernate depending on the needs of the populations and aquatic ecosystem.

As Mathur and da Cunha's research emphasize, it is important to provide anchors to allow for a form that we cannot entirely predict.³⁴

Slicing the rock, to catch the changing tides, provides a space in grand Bruit for power generation. Grand Bruit became the gap once the community relocated. This gap within the continuity of the southern coast will separate the ferry service to the east and west disconnecting the section from La Poile to Burgeo. A generation plant to utilize the energy stored can also transform and provide a safe wharf for those who decide to inhabit the community.

Contemporary energy infrastructure, usually hidden from the landscape, might take one more complex environmental and programmatic roles, and hence contribute to a programmatically and culturally pronounced historical narrative.



Figure 5: Harness Wave Energy: Created by Author

EPILOGUE:

"You can't go back in space: the myth of the return... Space has its times. To open up space to this kind of imagination means thinking about time and space together. You can't hold places and things still. What you can do is meet up with them, catch up with where another's history has got to 'now', and acknowledge that 'now' is itself constituted by that meeting up. 'Here', in that sense, is not a place on a map. It is that intersection of trajectories, the meeting-up of stories; an encounter."³⁵

In the year 2007 the government of Newfoundland had hired a consulting agency to conduct a feasibility study to test the viability of an offshore oilrig off of the southern coast of Newfoundland.

Like the cod industry before it, the oilrig will eventually exhaust its resource. Rusted, old, and dirty, the structure will stand useless as a coarse reminder of man's greed. Perhaps a team of men, chains, and marine vessels sail out and carefully, strategically topple the rig. It rests, at the ocean floor. It returns to nature and becomes an active agent in the dynamism of the ocean's surface. Nutrients, sediment collects on the skeleton and becomes part of a larger ecological space within the North Atlantic Ocean.

This place is shifting, and subject to winds, tides, politics. This architecture exchanges, converses, and reciprocates with its habitat by giving and taking, hiding and revealing, in response to the condition of the sea.

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