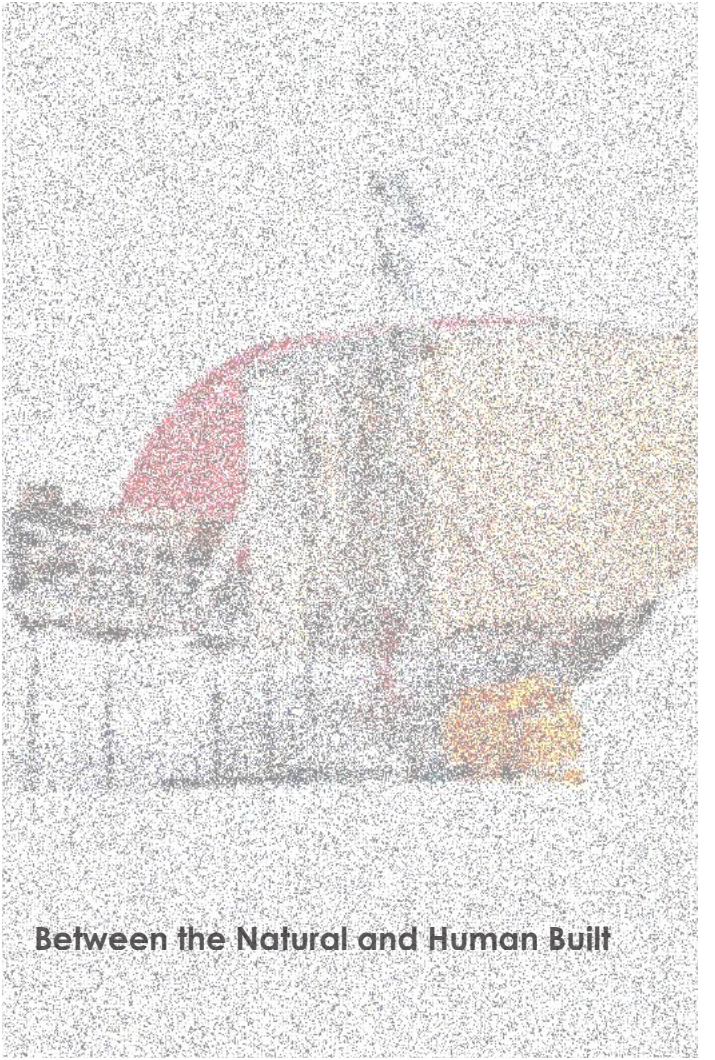


Between the Natural and Human Built

Between the Natural and the Human-Built:
An Arctic Navigational Architecture

Contents:

Forward

This project intends to confront the postindustrial transformation of natural landscapes through the implementation of networked and overlapping technological systems of organization. Using the Marconi Wireless Network as a precedent, the project initially analyzed the means by which wireless communication networks were first created as connections between defined transmission stations. Each station was equipped with a radio antennae, a means to power the antennae, and employees to manage the signals. Yet, upon further development of communications technology, both the Marconi network in its early form, and the stations that served it, became obsolete and were disassembled. In present times only the tower pylons are left of these stations, as their ties to surrounding social and environmental fabrics were temporary and conditional only upon the internal operation of the transatlantic network.

My thesis is that a new relation between technology and landscapebased in the acknowledgment of the cultural and social contextcan counteract the rapid obsolescence that communication and navigational technologies face in their natural sites.

Projections of declining annual sea ice extents have made the Arctic the new frontier for global capitalism. In addition to plans to develop the navigational infrastructure for international shipping routes through the melting Arctic Ocean, several mineral extraction facilities have been begun exploration and production within the Canadian Arctic Archipelago. Though enabled by a warming climate, these largescale organizations of transportation and production have neglected to work with the region's omnipresent climatic conditions; and, similar to their industrial precedents, have failed to acknowledge their intersection with preexisting local ecological frameworks, especially in terms of Inuit lifestyles that remain based on hunting and fishing. As an alternative response to these tendencies, this project proposes a new process for the conversion of the natural to the humanbuilt through the interweaving of disparate cultural forces in order to resist depletion and obsolescence.

Along these lines, a system of navigation and shared resource production will be created. Mineral extraction infrastructures will be reprogrammed and

channeled into existing migration networks to double as beacons and seasonal stations for hunters, miners, and perhaps the occasional researcher. Thus, the architecture is embedded in the reorganization of the territory's technological systems and is manifest physically at the specific moments of their confluence.

ATLAS OF EARLY WIRELESS AND ARCTIC TECHNOLOGIES

The images that follow constitute what could be considered an atlas of early wireless and arctic technologies. Ranging from the Marconi Company's creation of the first wireless communications network in the early 20th century to hydraulic jacking devices that could potentially respond to the freeze/thaw cycles of the arctic ground, these images helped to formulate a web of reference for considering how architecture could intervene at the scale of a network.

The Marconi Wireless Network

This project began one summer on the beach. But on a cold and rainy day not meant for summer recreation. And the beach was really a beach but a salt marsh on Nantucket Sound. I walked up a rode to the top of a hill over-looking a dense mat of tidal streams and cord-grass to encounter a historical plaque with a photograph taken from the exact viewpoint back in the 1950s. In the photograph, the same thick and empty boundary between water and land was entirely consumed by an array of utility poles and a tall radio tower with a mess of wires strung in-between. Up until 1999 this marshy beach had facilitated wireless communication between the land and ships at sea. But all that was left of that technology were a few timber poles, now home to Osprey nests, and the four concrete pylons of the tower's base.

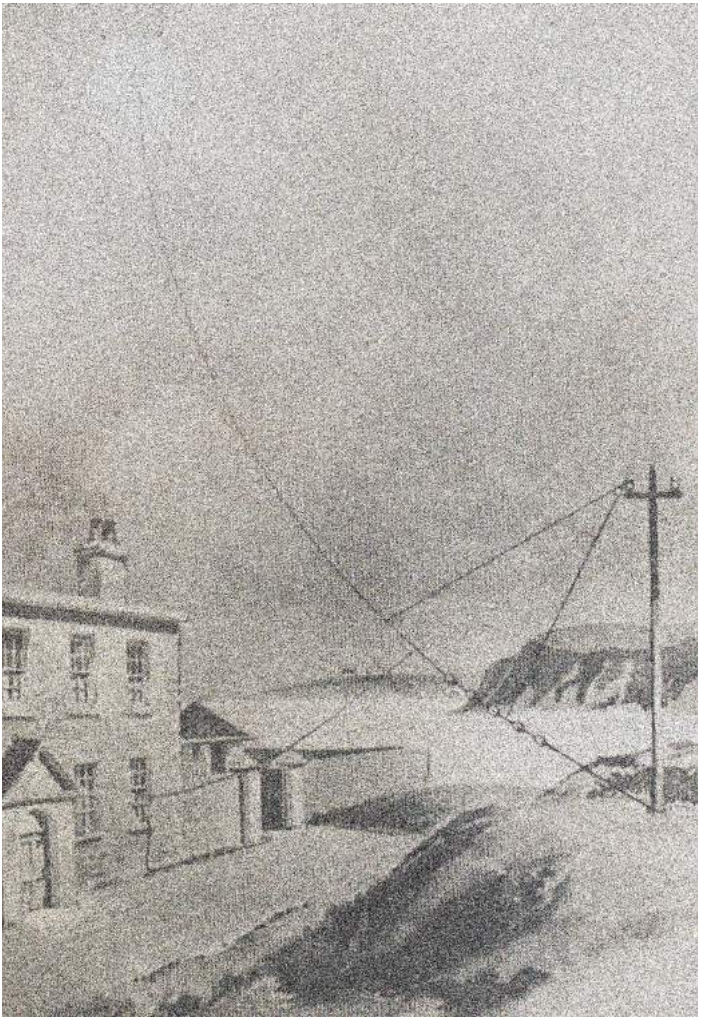
Immediately I was struck by the relationship between modern telecommunication technology and landscape. Already before me was evidence that this relationship had dramatically changed even in just the last two decades. But what was most fascinating was a lack of any visible transformation of the land itself. It looked like the technology had simply been placed there and then removed without leaving a scratch. Yet I suspected that this was not the case, that this site's return to nature was a complex transformation that involved the co-mingling of both ecological and human-driven processes, which could only be revealed through critical research.

Indeed, upon further investigation I learned that this station was built by the Marconi Company in conjunction with the creation of

the first international wireless network. By World War II their systems had become so sophisticated that they established the basis for all radio communication technologies until the late 20th century. But just as these technologies signaled a jump from the cable-based telegraphic transmissions of the late 1800s, to signals transmitted through electromagnetic fields--or from the land to the sky--we are in the midst of another transition--this one from the sky to space. Might we bring it back to land where new frontiers are being tamed?

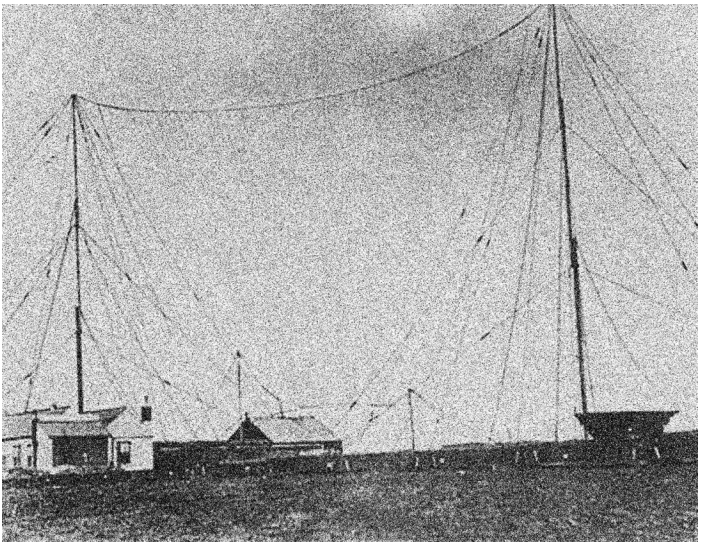
Guglielmo Marconi and his spark gap wireless device

The western side of the first trans-Atlantic wireless transmission, Coast of Newfoundland

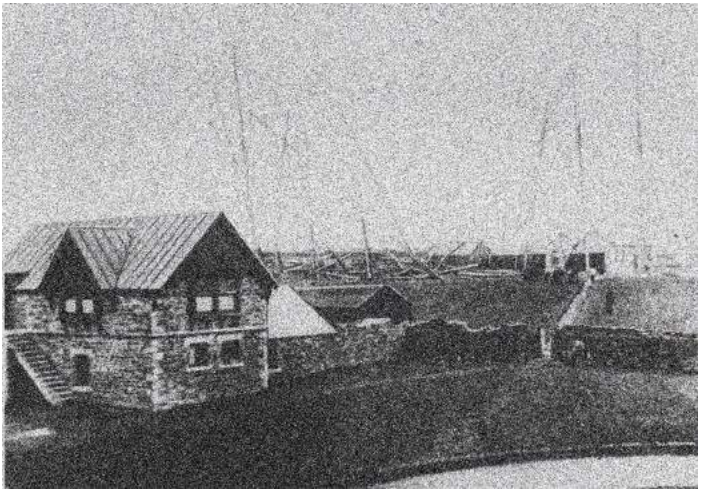


Marconi Men at Newfoundland attempting to get a kite airborne with a wire antennae attached

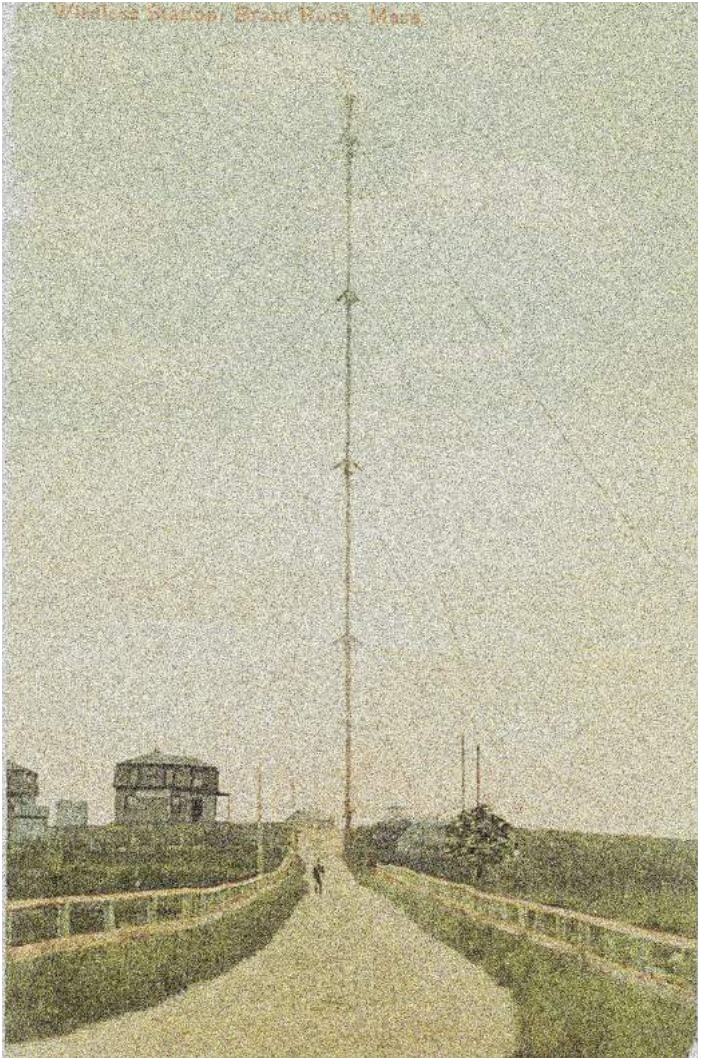
The eastern side of the first transatlantic signal - a temporary antennae erected quickly after a small radial array collapsed under strong winds, Poldhu, England



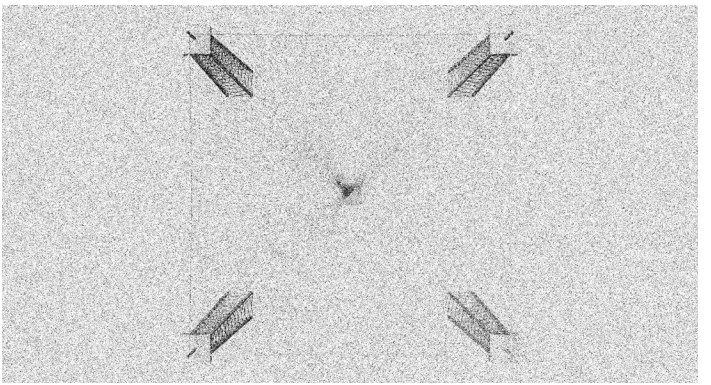
The collapsed radial array in Poldhu



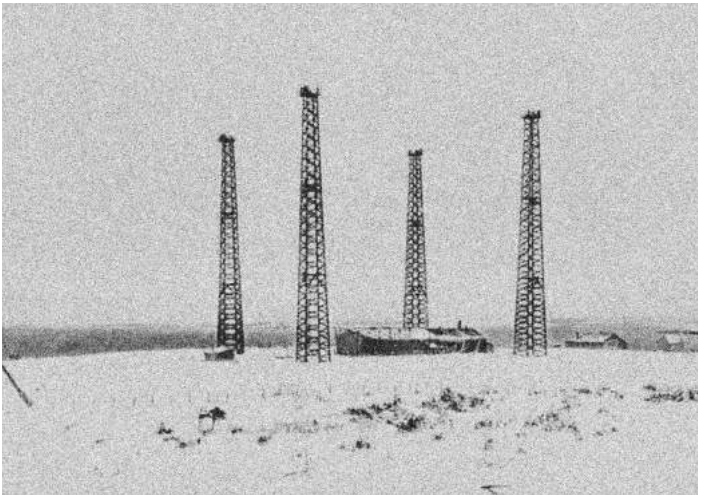
Wireless Station at Brant Rock, Massachusetts, 1910


Wireless Station, Brant Rock, Mass.

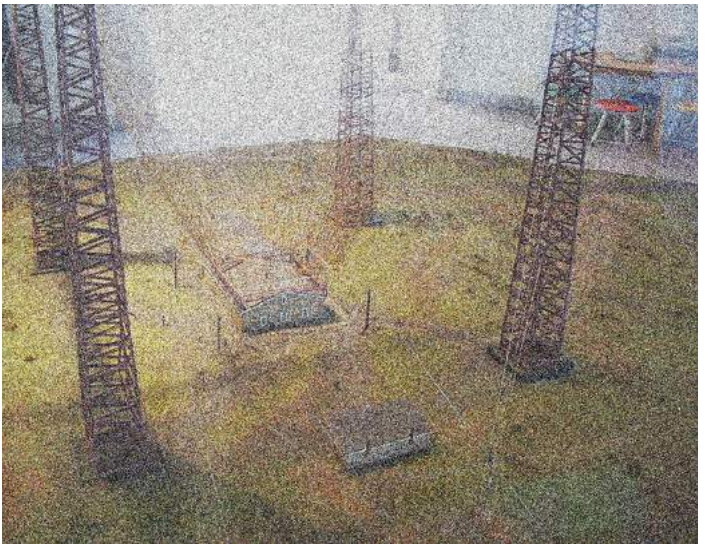
Aerial Diagram of 4-tower Marconi Antennae, first installed in 1904 on top of a sandy ocean bluff at South Wellfleet, Massachusetts



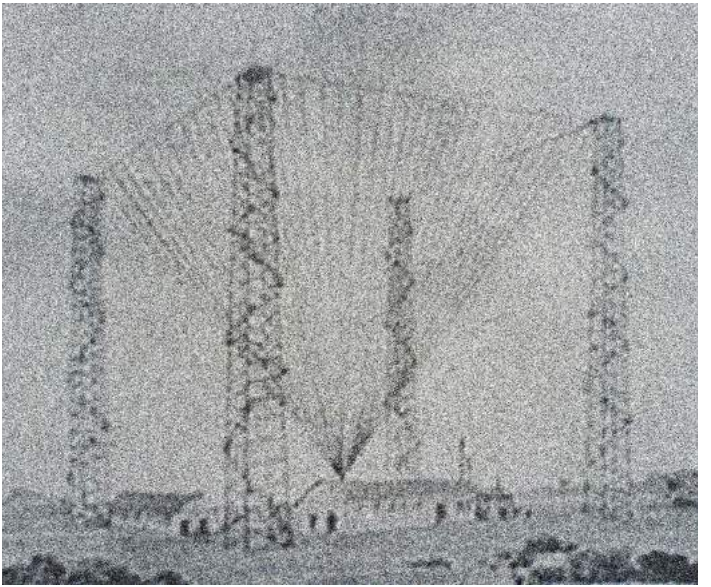
Marconi Wireless Station at Wellfleet, Massachusetts



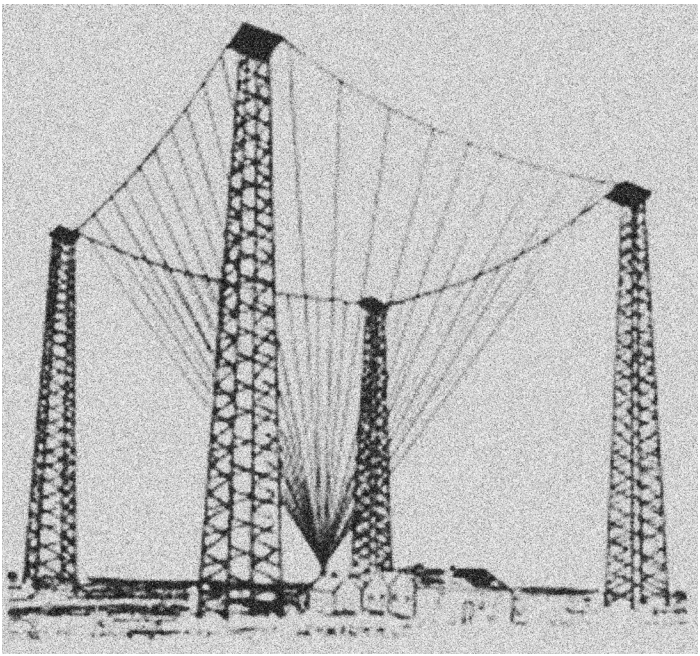
Scaled model of Marconi Station at Glace Bay, Nova Scotia



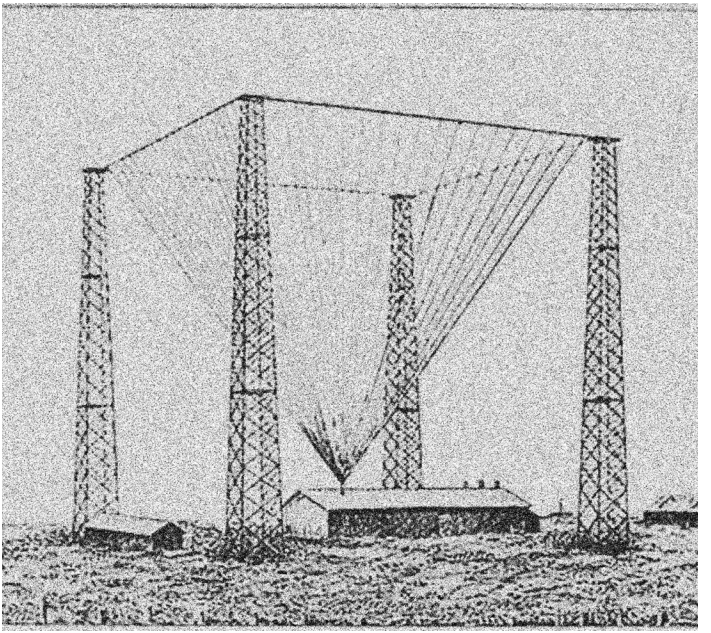
Marconi Station at Glace Bay, Nova Scotia



Marconi Station at Poldhu, England



Marconi Station at Glace Bay, Nova Scotia



Marconi Station at Glace Bay, Nova Scotia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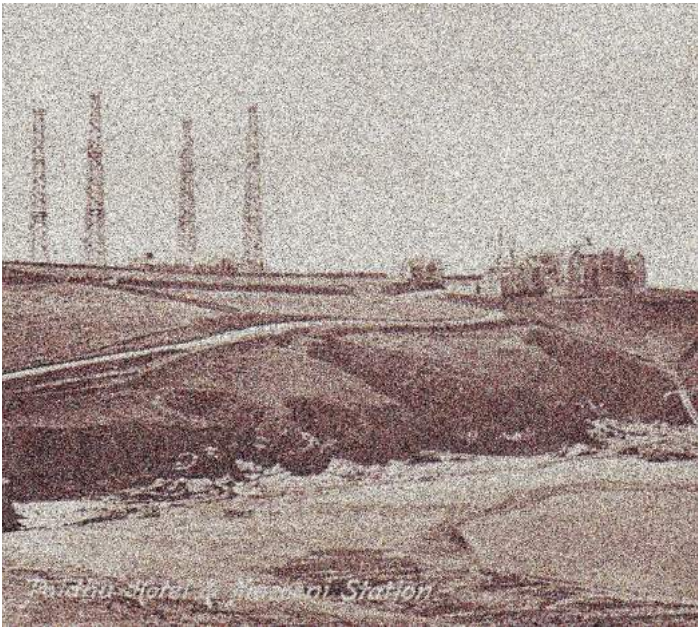
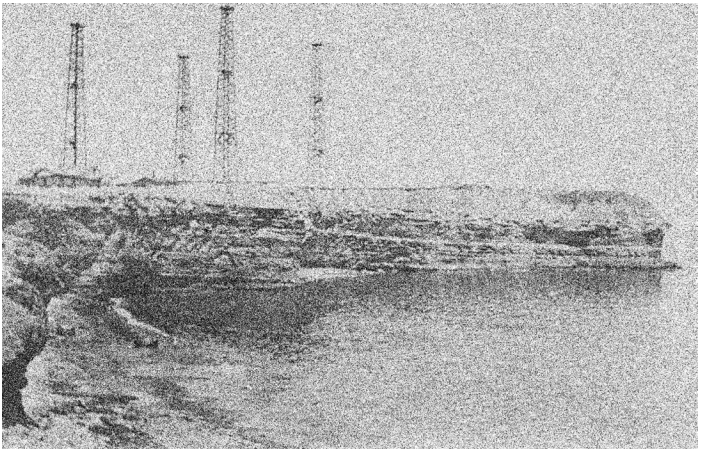
GLACE BAY NS

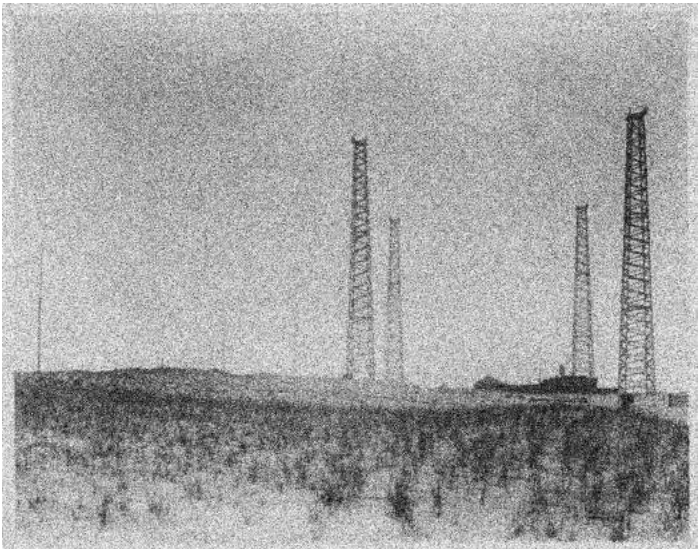
Marconi Station at Poldhu, England


Poidiu Hotel & Junction Station

Marconi Station at Glace Bay, Nova Scotia



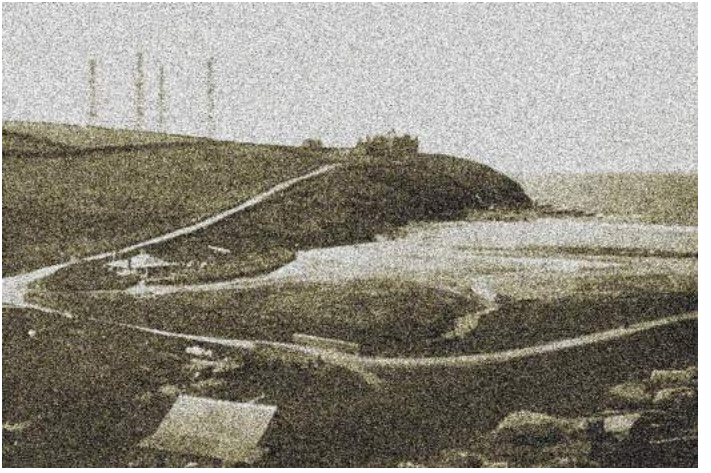
Marconi Station at Wellfleet, Massachusetts



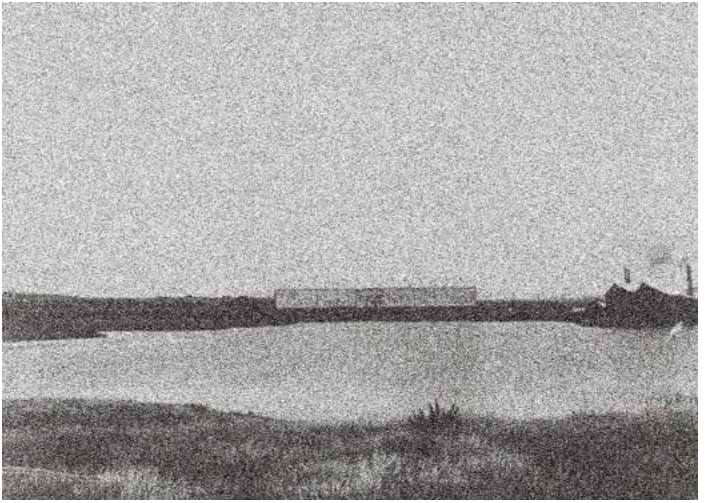
Marconi Station at Glace Bay, Nova Scotia

Marconi Wireless Telegraph Station, Glace Bay, C.B.

Marconi Station at Poldhu, England

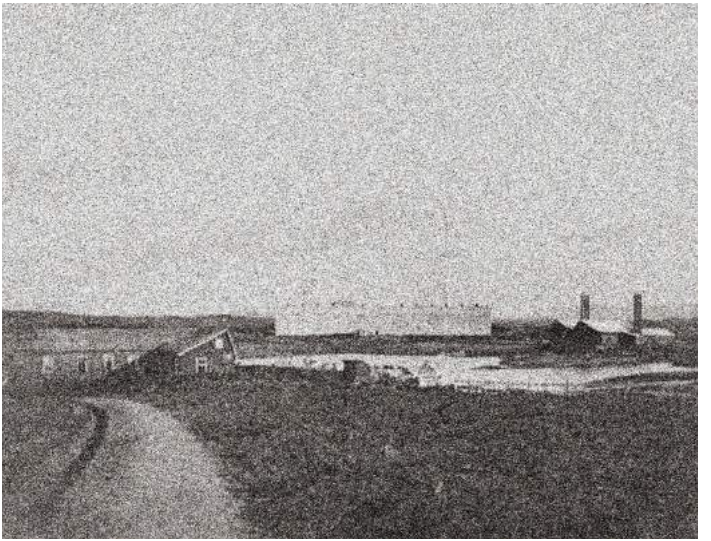


Condenser building and peat poss power plant at the Marconi Station in Clifden, Ireland. The peat moss was harvested from the surrounding bog.

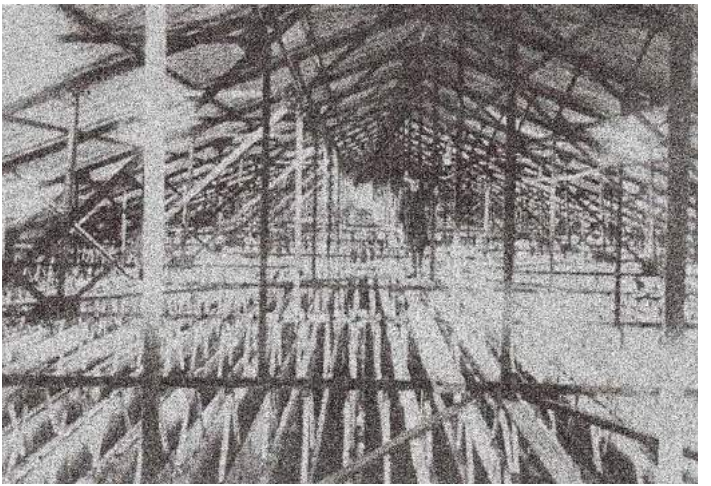


The road to the Marconi Station at Clifden, Ireland. The first transatlantic flight crashed in this bog, which the pilots Alcock and Brown believed to be a grassy field.

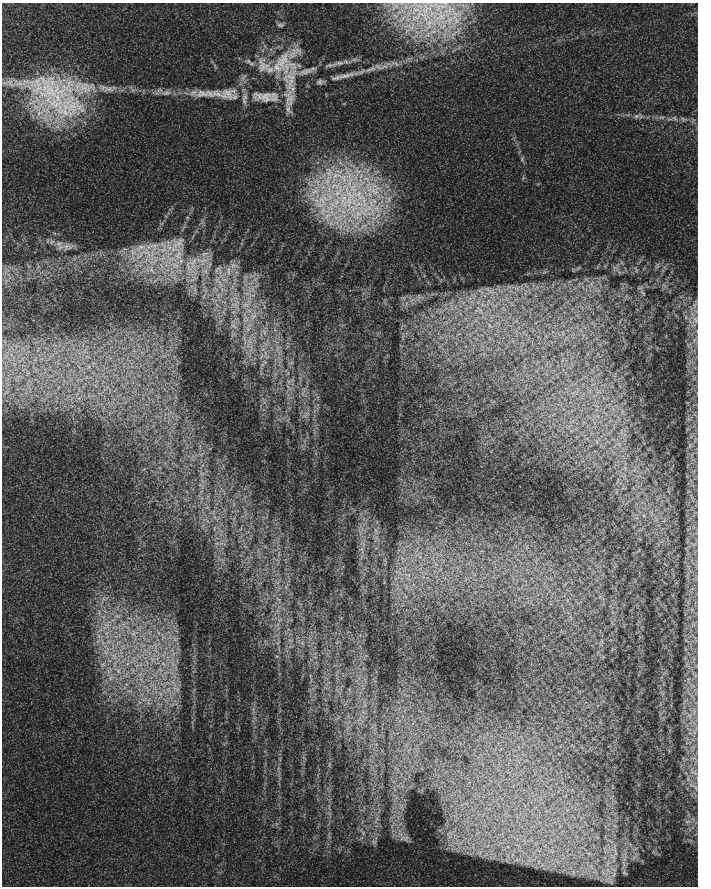
Marconi Station at Clifden, Ireland



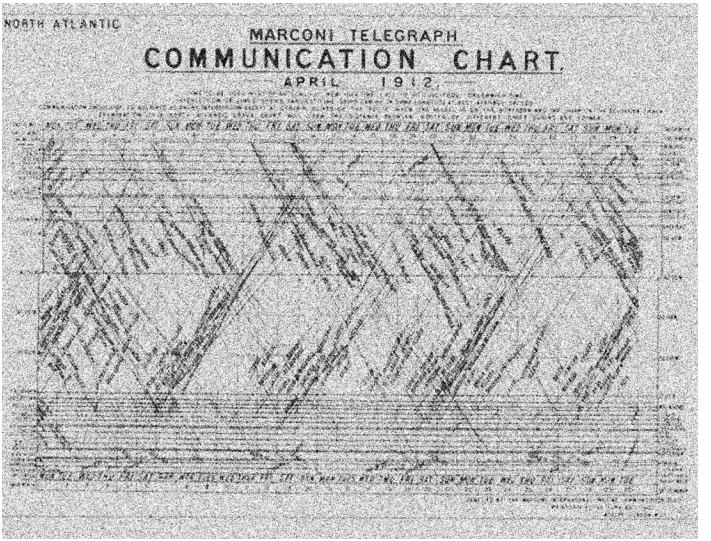
Inside the condenser building at Clifden, Ireland



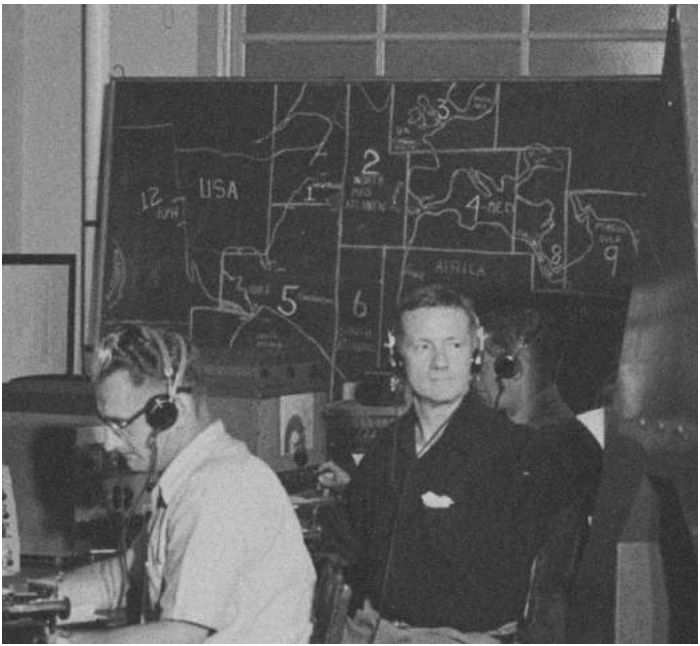
A Marconi Man standing in front of one the massive condenser plates at Clifden, Ireland



A communication chart for the North Atlantic Division of the Marconi Company showing the sequence of connections between stations.

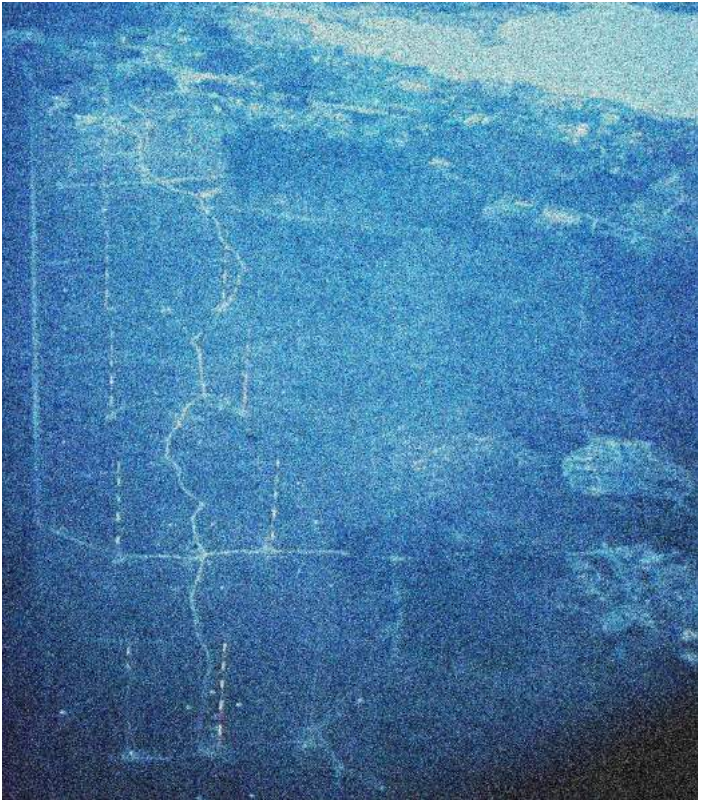

NORTH ATLANTIC
MARCONI TELEGRAPH
COMMUNICATION CHART.
APRIL 1912.

Inside a Marconi Station at Chatham, Massachusetts. The diagram on the chalkboard the transmission regions of the Marconi Network in the mid-20th century.


USA
2
3
4
5
6
8
9

New radio technology pioneered by Lee DeForest and his vacuum tube rendered the early Marconi wireless network obsolete. This station in South Chatham, Massachusetts was originally operated by the Marconi company but became part of RCA's Global Communication Network with a modern radio tower for ship-to-shore communication.

Marconi transmitter array at Marion, Massachusetts

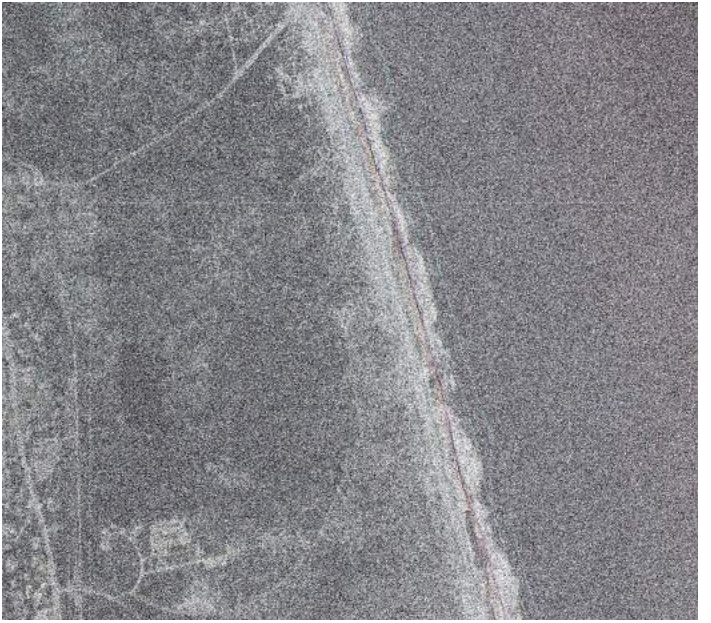


Remains of foundations and tower bases at Clifden, Ireland

Remains of foundations and tower bases of Marconi Station near Bolinas, California

Marconi Site in Poldhu, England in present day

Aerial image above the old location of the South Wellfleet Station



The remains of the tower foundations at the South Wellfleet Station

The beach and eroded cliff at the South Wellfleet Station

Tower pylon at Clifden, Ireland

Ice and the Land Below

In 1912, the Marconi Wireless Network gained international when it was instrumental in the rescue of passengers aboard the RMS Titanic. After the ship struck an iceberg and began sinking 375 miles south of the Newfoundland coast, the Marconi wireless operator on board broadcast distress calls to nearby ships and the first signals on land were received by the Marconi station at South Wellfleet. Yet, simultaneously, the deficiencies of the Marconi telegraphic technology were also exposed as the company's transmission device could only transmit messages from point-to-point and only one at a time. Thus, while the wireless technology helped to save many lives, even more could have been saved if the Titanic had used a more advanced continuous wave, high-frequency transmitter, which was available at the time but blocked out of the wireless market by the Marconi Company's monopoly.

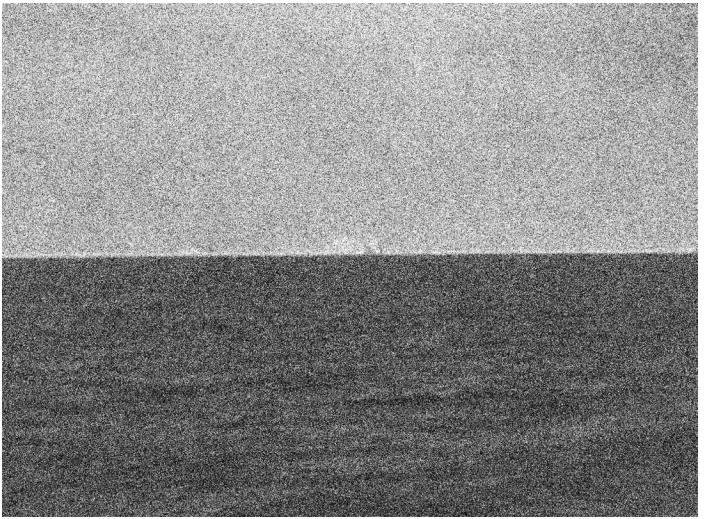
Meanwhile, the natural forces behind the Titanic catastrophe also received much attention. The press and an American/British joint inquiry cycled through photographs of icebergs sighted in the area as they searched for the one guilty of ripping a hole in the Titanic's belly. As tides were high for the year, fragments of melting glaciers in Greenland which usually would have landed in northern Canada drifted into the southward moving Labrador Current and were pulled farther south than usual. At the same time, the higher ocean was quickly eroding the sand cliff on top of which of the South Wellfleet Marconi Station was sited (150 feet in 15 years), eventually forcing the towers there to be abandoned. In sum, advancements in technology could always be measured against global transformations of land.

Today the greatest potential for transformation exists where it always has: at the edges of the next frontier, which today could be understood as the polar regions. In the north, the melting of the Arctic Ocean introduces the potential of a new international shipping route - with the Canadian Arctic, rich in mineral resources - situated halfway between Asian and European markets. Intense speculation on the reduction of sea ice accompanies reductions in shipping time and the inclusion of new territories in the search for the fresh reserves of oil, copper, gold, silver, aluminum, uranium, and diamonds.

The conversion of the Canadian Arctic into a post-industrial landscape would be the second step away from its treeless natural state as a land of nomadic hunters. The first occurred in the Cold War of the 1950s, when the Canadian and United States governments expressed an interest in using the territory a line of defense against a feared Soviet attack from across the North. To establish sovereignty of the area, the Canadian forced/compelled the nomadic Inuit to move to new permanent settlements in to help construct the stations of the Distant Early Warning Line. The DEW Line, as it became known, ringed the Canadian Arctic with 63 high intensity radar stations capable of detecting Soviet bombers. All built in the summers between 1955-1957, the stations were operated and maintained by the Canadian and US military with the assistance of Inuit laborers.

The iceberg suspected of the Titanic's demise

The sheet of sea ice had been seen by ships sailing ahead of the Titanic. It was a wall, 40 feet high in some places, that stretched endlessly above the horizon line.



This iceberg was spotted by a ship in the area of the Titanic wreck and had traces of red paint embedded in its surface.

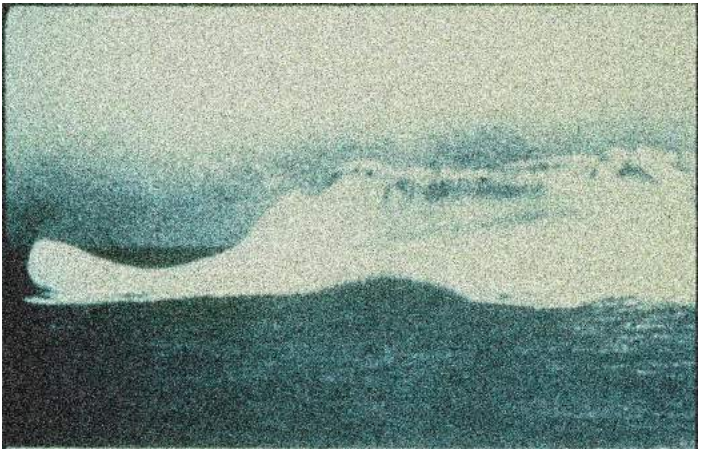
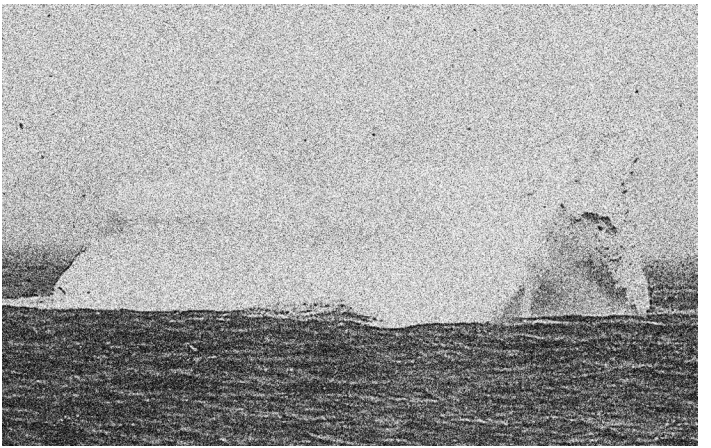
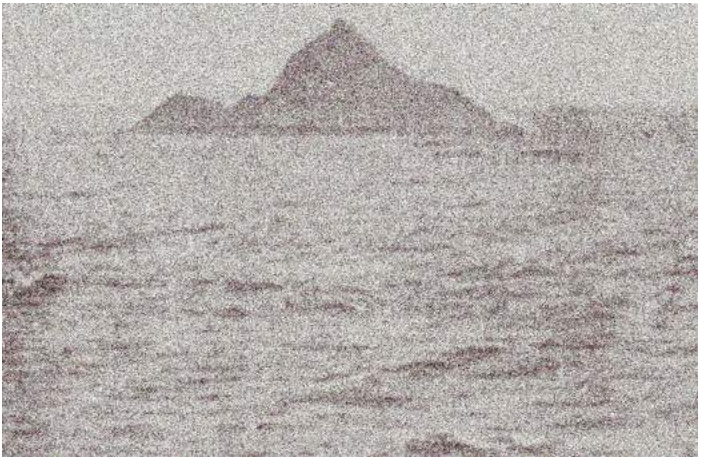


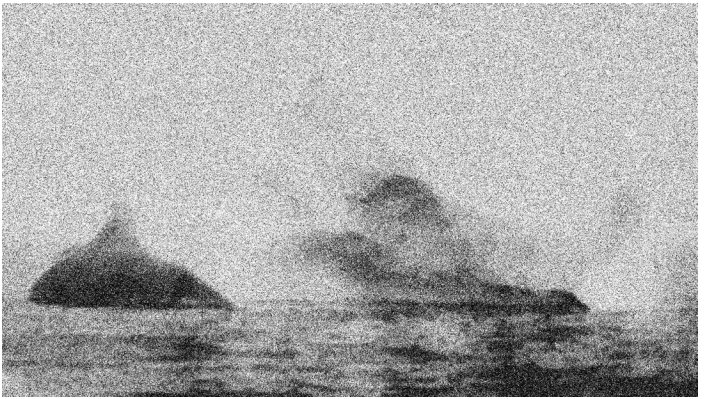
Photo taken April 20, 1912



Iceberg matching sketches of passengers aboard the Titanic



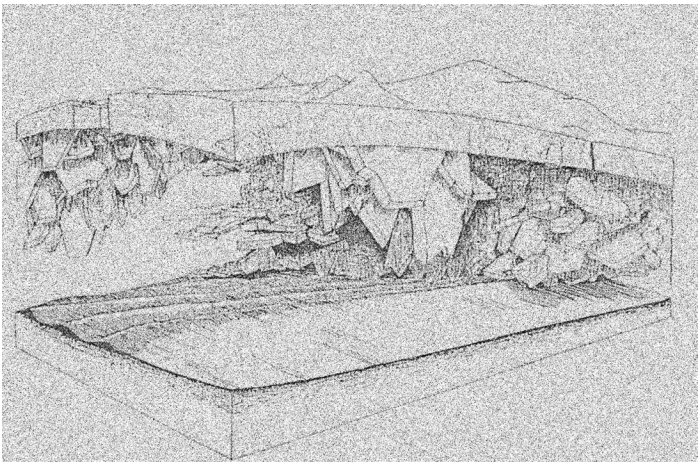
Another potential culprit



Projection of the Titanic on an iceberg by Gerry Hofstetter, April 2012

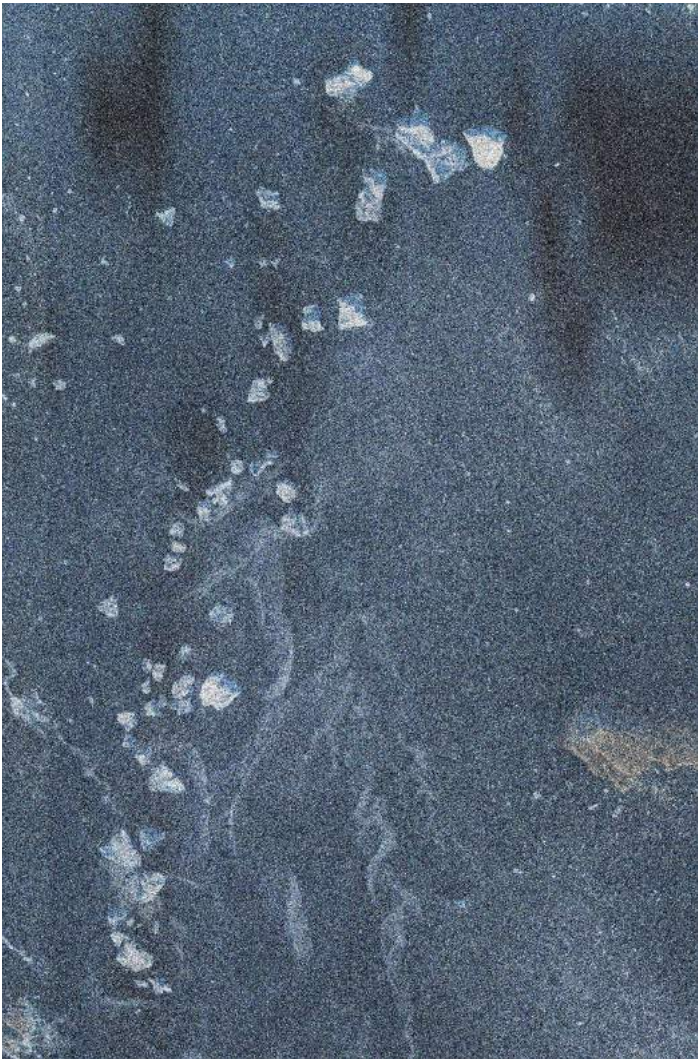
Photograph captured two days before the Titanic sank, auctioned in 2012 for around $9,000

Sea ice in the Arctic behaves differently than icebergs drifting in open water. Along the projected Northwest Passage through Canadian Arctic Archipelago, the ice freezes in dynamic surface above the ocean. Wind, bathymetry, currents, and water salinity work to determine the behavior of the ice. At time, pressure builds in the ice sheets. Similar to the process of mountains rising out of the collision out of the tectonic plates of the earth, pressure ridges can and often do rise explode out of the ice. The ridges pose threats to travel across the ice, but become habitats for seals who burrow into the pockets that form around the fracture.



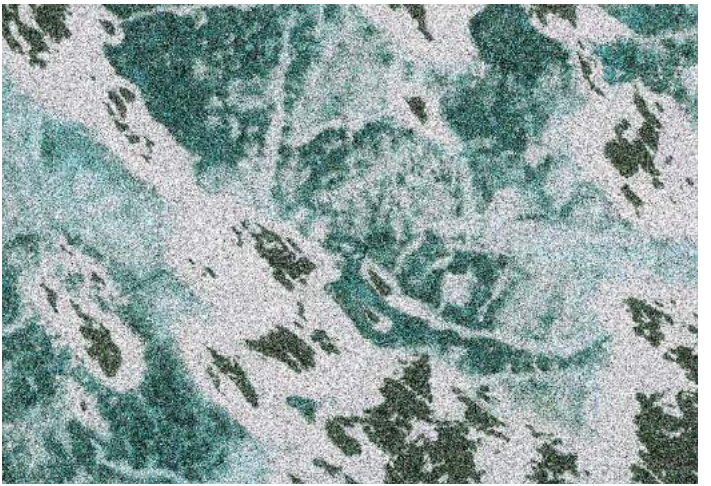
Late summer sea ice conditions along the Northwest Passage

Icebergs recently from the Jakobshavn glacier in Greenland



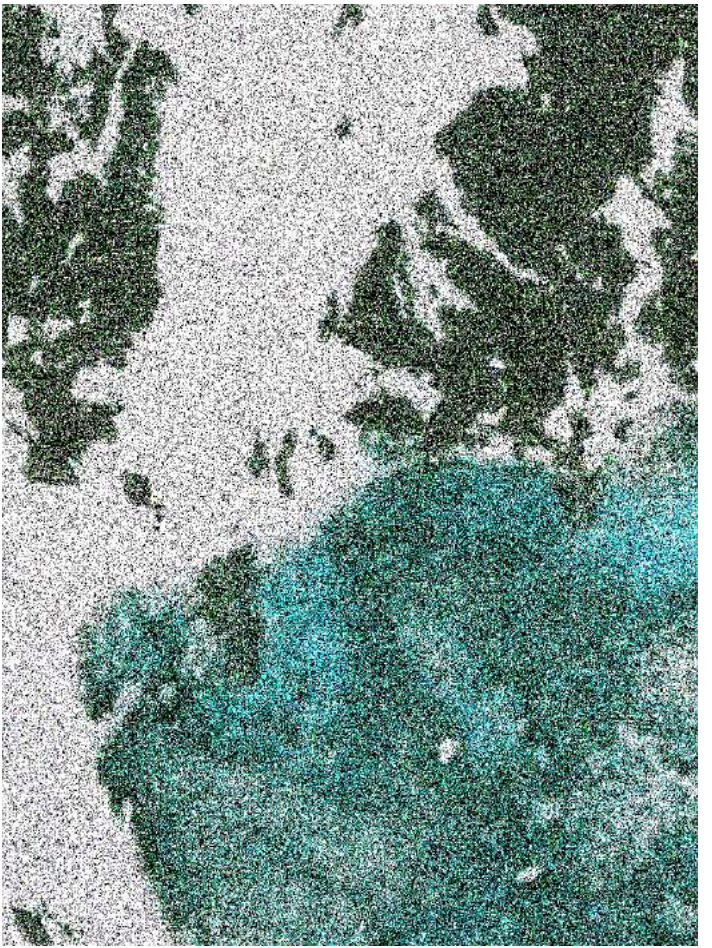
Jakobshavn glacier in Greenland

Late winter Arctic landscape, inland from the Coronation Gulf

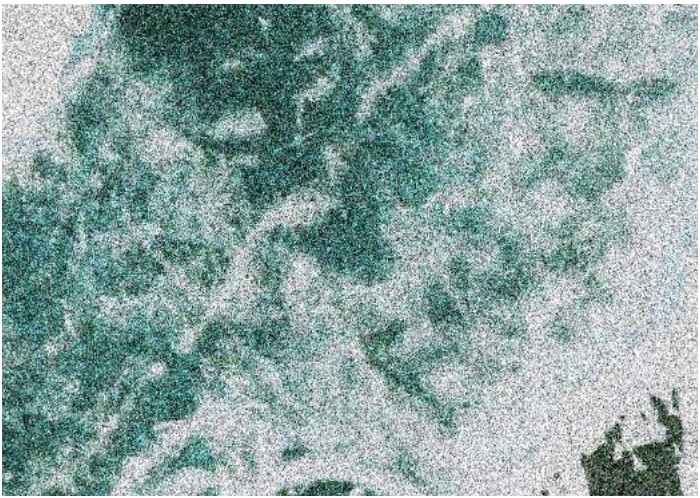


Late winter Arctic landscape, inland from the Coronation Gulf, and along a possible winter road for a large road, port, and mine proposal for the Canadian Arctic, 67.648454,-111.38472

Late winter Arctic landscape, inland from the Coronation Gulf, and along a possible winter road for a large road, port, and mine proposal for the Canadian Arctic, 67.644333,-111.400427



67.644578,-111.389943

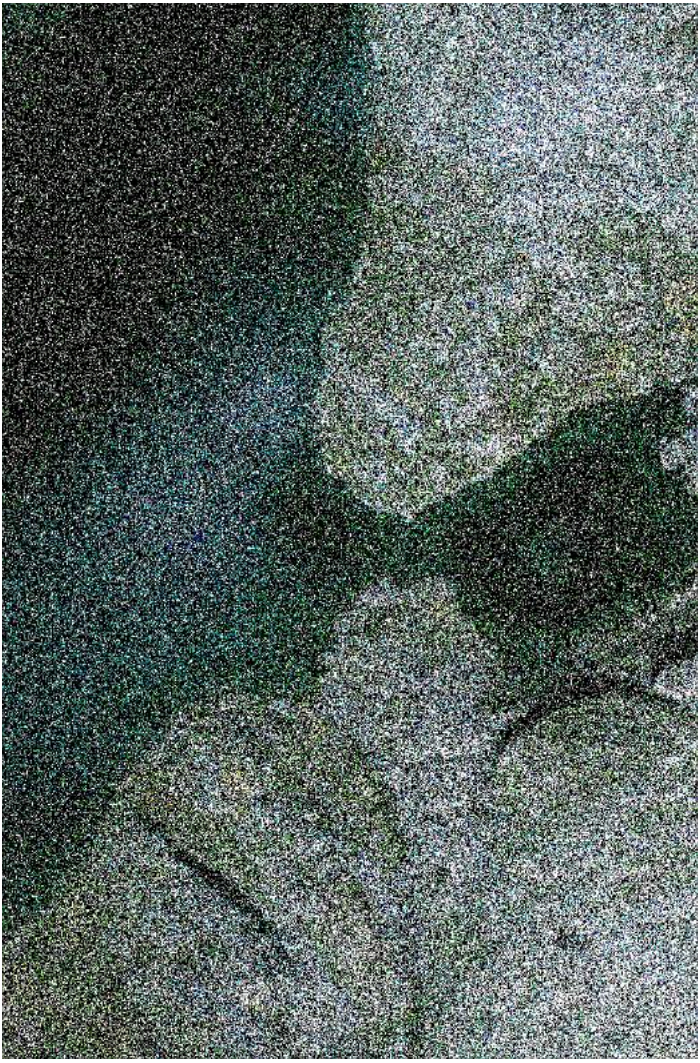


Aerial image of pressure ridge

Canadian Coast Guard Icebreaker

MV Arctic, services mining operations in the Canadian Arctic

Canadian Arctic in the Summer



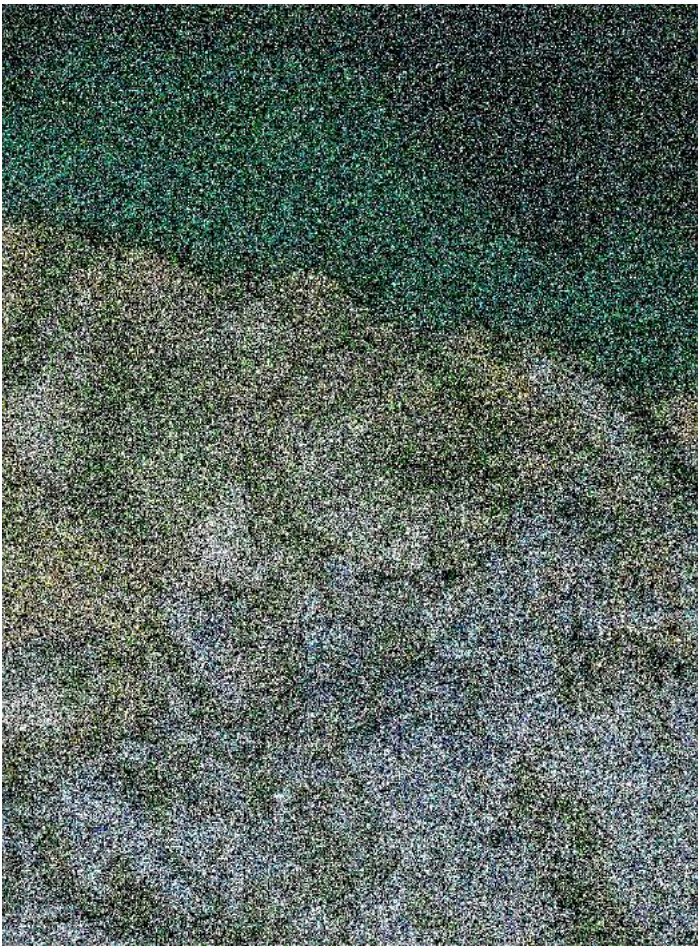
Lakes and small water bodies dominate

Linear clusters of rocks and boulders formed in the deglaciation process are known as Eskers. They are the preferred habitat for wolves and, often situated at high points in the topography, were ideal locations for stone beacons (known as inukshuk) and campsites for nomadic Inuit. Eskers in the post-industrial world are seen as a major source of valuable aggregate for the construction of roads and transportation infrastructure

Esker along the route of the Izok Corridor project

The summer ground plane in the Canadian Arctic is composed of both exposed bedrock and the active layer of permafrost.

Near High Lake Mine, 67.39116,-110.847602



Eroded coast line in the Arctic revealed the active layer of Permafrost and ice wedges in the ground