

ISLANDS

CULTURAL
NATURAL
ARTIFICIAL



ISLANDS

Cultural, Natural and Artificial

École Polytechnique Fédérale de Lausanne
Master Thesis in Architecture

by
Martin Handley

under the guidance of
Professor Harry Gugger
Professor Jean-Louis Scartezzini
Charlotte Truwant

ACKNOWLEDGEMENTS

Foremost, I would like to thank my thesis advisors Professor Gugger, Charlotte Truwant, and the Laba collaborators, as well as Professor Scartezzini, for their invaluable guidance during this semester. They allowed this paper to be my own work, while steering me in the right direction whenever I had doubts.

I would like to thank Nancy Couling, with whom I was able to share information and ideas on matters relating to the North Sea and the role of ocean space in general.

I would also like to acknowledge Stian Aamot, havbase.no, and Norwegian Coastal Administration, for their precious help in gathering shipping data for the North Sea.

Last but not least, I would like to express my deep gratitude to my parents, family, and friends for their support and encouragement throughout my studies at EPFL, and without whom this work would not have been possible. Thank you.

Martin Handley

TABLE OF CONTENTS

| | |
|--------------------------------------|----|
| Acknowledgements | |
| Preface | 2 |
| Definition | 4 |
| Chapter 1: Islands | |
| <hr/> | |
| Introduction | 8 |
| Cultural Islands | 10 |
| Natural Islands | 14 |
| As a means of control | 14 |
| As an economic outpost | 16 |
| As an instrument of research | 20 |
| As a place of exile | 22 |
| As a source of otherness | 22 |
| Chapter 2: Artificial Islands | |
| <hr/> | |
| Introduction | 26 |
| Purpose | 30 |
| As a means of control | 30 |
| As an excised infrastructure | 34 |
| As an economic outpost | 36 |
| As a source of otherness | 38 |
| Form | 40 |
| Contextual | 40 |
| Function | 42 |
| Symbolical | 44 |
| Preliminary Conclusion | 46 |

Chapter 3: The North Sea Island

| | |
|--------------------------------|----|
| Introduction | 54 |
| The North Sea Today | 56 |
| The Energy Hub Project | 58 |
| The Dogger Bank | 58 |
| The Mapping | 58 |
| Geomorphologies | 60 |
| Geological Formation | 60 |
| Bathymetry, tides and currents | 60 |
| Ecological Morphologies | 64 |
| Fauna and Natura 2000 | 64 |
| Anthropogenic Morphologies | 66 |
| Fishing Industry | 66 |
| Transportation | 68 |
| Oil & Gas Industry | 72 |
| Renewable energies | 76 |
| Conclusion | 78 |
| References | 80 |
| Image Sources | 82 |

PREFACE

The impetus behind this research came from reading a news article about Dogger Island: an artificial island project in the North Sea that would act as an energy hub for the surrounding countries. It spiked my interest in man-made objects at sea, that seem to be proliferating in recent decades, and transforming the seascape into a more and more urbanised space. [Couling, Topalovic, Brenner and Schmid] However, they appeared to be mostly tools to better exploit far-reaching territories, and thereby, increasing their importance as hinterlands.

To better understand what is driving the artificial island phenomenon, this thesis will start by exploring the idea of islandness, which seems to be “part myth, par marketing hype, and part reality.” [Baldacchino, 2012] It will then expand on artificial islands by studying and classifying their purpose and form.

Initial observations seem to show a complete disregard for their context. Is it really a “tabula rasa”, as Rem Koolhaas describes it when talking about the Persian Gulf? Or is the seascape just not as worthy of consideration as the landscape? The third chapter will use the Dogger island project in the North Sea to exemplify these concerns and question these man-made landforms. Can they become more than just spaces of production? Could they actually crystallise utopic dreams portrayed in literary fictions?



J. M. W. Turner. Venice from the Laguna. 1835.

DEFINITION

What is an island?

The definition given by the Collins dictionary seems incomplete: “an island is a piece of land that is completely surrounded by water.” No characteristic in this description distinguishes them from continental lands. Islands are different from one another. Nature and man shaped them as singular entities. The only common denominator is their insularity. But insularity is not a clearly defined concept. At which point does an island become a continent? What about America, Australia, Greenland or Japan? Does size really define insularity? Less the island is populated the more isolated it feels. More the population density is high, the less insular it feels, like Singapore. The further the island is from the continent, the more its population feels insular. What about islands that are linked to the continent by a tunnel or a bridge? Since the opening of the channel tunnel, is the United Kingdom still an island? [Seguí Llineàs, 2012] The attempt to define the word “island” seems to bring up more questions than answers. In the opening discourse of the Island Studies Journal’s first volume published in 2006, academic geographer, Peter Hay said: “Even the question of what constitutes an island is not conclusively settled”.

Islandness is indeed a hard task to define. John R. Gillis and David Lowenthal wrote a brief explanation of this complexity in their introduction to the Geographical Review 97, back in 2007. “It takes as many different

forms as there are islands. Its meaning differs from place to place as well as over time. There are Eastern and Western variants; the islandness of a resident is not the same as that of a visitor; it means something different off island than on. Islandness has taken on a whole new meaning today, since distinctions between islands and continents, once taken for granted, have become muted or dubious. In our time, when people are connected more electronically than territorially, the entire world is becoming archipelagic, with islands appearing everywhere, inland as well as offshore. Cities are “heat islands”; rural areas are “islands of tranquillity.” Islandness is no longer associated only with water-bound places. The planet itself is now perceived as Earth island.”

Despite this apparent complexity, and more in relation to the words from San Rocco Islands than the emerging contemporary notions cited above, this thesis will explore islands framed as, any object, natural or man-made, isolated from the continents within a water plane.

*“An island is any piece of land that is surrounded by water.
An island is any object lost in an endless extension of a uniform element.
As such, the island is isolated.
The island is by definition remote, separated, intimately alternative.
The island is elsewhere.
Islands can be natural or artificial: atolls, rocks, volcanos, oases,
spaceships, oil rigs, carriers.”*

San Rocco Islands, Editorial, 2011



CHAPTER 1:
ISLANDS

INTRODUCTION

Nowadays, the entire surface of the globe has been mapped, leaving no unknown territories to be discovered. Yet the island imaginary left behind by tales and myths, describing them as isolated paradise-like worlds, still resonates. Evidence of this can be seen in the list of UNESCO world heritage sites. Indeed, despite covering only 1.86% of the Earth's surface area, they represented 13.1% [106 of 812 entries] of the registered places in 2006. [Baldacchino, 2006]

Islands have never had such a prominent place in our societies as they have today. The "island lure", as Godfrey Baldacchino calls it, cannot be solely explained by an island's physical conditions. It is equally defined by its metaphorical and fictional constructs elaborated over time by humans in need of otherness. An island is first and foremost a cultural object.

This chapter will discuss the roles societies have bestowed upon cultural and natural islands through time in order to better understand how they might be fuelling the current development of artificial islands.

As cultural objects, they have been interpreted as sacred territories, home of the gods, the elixir of life, and utopian communities; and the source of countless literary fictions and expeditions in the search of an idyllic world.

Natural islands have been used as places of exile, military and migration control, scientific research and testing, and holiday escapism. The isolation from the mainland - limiting accessibility and contamination – and the ability to shape the island into some kind of exclusivity are key aspects of this landform. As Baldacchino summarises, "To island is to control."

An island...concentrates the dreams of an Arcadia with which civilization has always been haunted. It is a place defined by its otherness, thriving on nothing more than its distance and difference from the mainland to which it is opposed.

The Geographical review, volume 97, number 2
The Islands, Adam Nicolson

CULTURAL ISLANDS

Although islands have now been extensively photographed, inventoried and modernised, they remain objects apart from the mainland. Travelling to an island has always been, and still is, essentially a search for otherness. Its figure, clearly defined within the endless and blurry ocean, appears isolated and self-sufficient. As such, the island is one of the most accomplished and completed figures of our world; which is why the island is reassuring. It provides the illusion of understanding the world as a whole. [Péron, 2011] In other words, "The appeal of the island metaphor lies in its capacity to simplify the complex and frame the apparently unbounded." [Daou, 2016] Thereby painting an easily describable, compressible and controllable picture of a world separate from ours, hidden out at sea, where everything becomes possible.

Françoise Péron, emeritus Professor of geography at the University of Bretagne Occidentale, explains that the island appeal began with the late modern era, in the 18th century. This idealised figure of the island, as we know it today, is a historical and cultural construct that was born in the western world. It existed before the industrial revolution in the 19th century, so it was already well known when the tourists of the end of the that century visited islands. Their perceptions of these landforms had therefore already been altered.

It is indeed during the Enlightenment Age that new theories on our society and most suitable ways of governing were formed. Ideas by Jean-Jacques Rousseau, that oppose the virtues of a population that remained at a "natural state", to the corruption of civilised societies, were adopted quickly by public opinion. [Péron, 2012] In this western context, islands that were being discovered acted as archetypes for insularity, as places unaffected by the passing of time, where everything functions differently, and inhabited by a society that preserved all of its original purity. They materialise a possible return to the origins of humanity. This explains the popularity of Daniel Defoe's Robinson Crusoe published in 1719. Before that, the

multiple islands described in Homer's Odyssey, or the idyllic one depicted in Sir Thomas More's Utopia, provided an ideal context to form a critical view on societal issues. Louis Marin explains that the word Utopia - first coined by More in 1516 to describe his fictional island - was a clever combination of two homophonous Greek words οὐτόπος [no-place] and εὐτόπος [good-place], which is why this term has become synonymous of an ideal society as well as an unreachable, non-existent world.

On the other hand, Bin Luo offers us a different perspective. One that is not western-centric. In Ancient and Imperial China - since the 3rd century BCE - islands were also subject to many cultural significations. They were viewed as sacred and unapproachable fairylands, home to the elixir of immortality - not dissimilar to Bimini's fountain of youth in the Bahamas described by Herodotus in the 5th century BCE. Eventually, islands were associated with the home of gods by Taoism, or home of dragon kings by Chinese Buddhism. The three most famous sacred islands during the Qin and Han Dynasties were Penglai, Fangzhang, Yingzhou, which were simultaneously viewed as metaphorical places and physical entities. This led to countless attempts to find them. During the 2nd century BCE, the Emperor Qin Shihuang - who had ordered several voyages in their search - had an artificial lake with three mounds constructed within the Imperial gardens in reference to the three sacred islands. Their purpose was purely symbolical and for ritual processions. Usually home to monasteries, they supposedly granted exclusive powers to their builder and possessors. Imperial China's approach to artificial islands seems to share similarities with the iconic artificial islands of Dubai. Could the latter also be a sign of resignation towards an unattainable and probably non-existent imaginary? An attempt to find some contentment in an artificial version of it?



More, Thomas. Island of Utopia. 1516.



Yuan, Yao. Penglai, Depiction of One of the Mythical Islands. 1700s.

NATURAL ISLANDS

Islands are more than just metaphors. Although they provide food for thought, a viewpoint that also engages with natural islands seems more productive to the design disciplines. [Staniscia, 2017] From a mainland perspective, they have been held in high esteem - at least dating back to the Odyssey - crediting them with a pivotal role in political, economic, scientific and social dimensions. [Baldacchino, 2012] To better understand these roles, the natural islands studied in this thesis will be divided into five subparts: the island as a means for control, as an economic outpost, as an instrument of research, as a place of exile, and finally, as a source of otherness.

AS A MEANS FOR CONTROL

In recent years, the strategic geographical location of some islands has drastically modified their livelihood by transforming them into objects of border control. In an effort to better regulate migration flows, Australia implemented from 2001 to 2007 what is known as the Pacific Solution. They decided to excise thousands of islands from Australia's migration zone, and started intercepting and redirecting refugees to detention centres in third countries - like Nauru and Papua New Guinea - to discourage asylum seekers from doing the journey by boat. After its dismantlement in 2008, a similar policy of "offshore processing" was implemented in 2012. This offered a new financial opportunity for islands like Nauru which had not managed to revive its economy after the exhaustion of phosphate mining in the early 1990s. It obtained over 60 million dollars in aid over the six years - a notable sum for such a small country. [Pezzani, 2011]

Nauru is not an isolated case. Lampedusa, in the Mediterranean, is used in a similar way by the European Union since the early 2000s. It is the furthest "outpost of the European fortress" [Staniscia, 2013] and acts as a gateway - a transit space - that records and controls all of the migration flows towards Europe. The overflow of migration from January to March 2011 changed its status from one of transit to one of detention [Staniscia, 2013], thus putting considerable pressure on the island's facilities, to a point where 23'000 migrants had arrived on the island's 20 km², and thereby dwarfing the local population of roughly 5'000 inhabitants. Over the past 20 years, approximately 400'000 people crossed the Mediterranean to reach Lampedusa, and at least 15'000 died trying to do so. The island's patience and welcoming culture towards migrants - which it had become known for over the years - seems to be wearing thin as newly elected mayor displays an anti-migration stance. [Merelli, 2017]



Pezzani, Lorenzo. A Pacific Solution. 2011.



Migration flows towards Europe

AS AN ECONOMIC OUTPOST

During the first half of the 20th century, coastal areas were greatly reconfigured by international trade and the expansion of rail transport which opened the backcountries. Islands became outposts of coastal economies. Their sudden population growth was mainly due to young men in search of jobs in the fishing sector or building of infrastructures such as ports, lighthouses, or military defence structures; and women working in fishing factories. [Péron, 2011]

For example, in Iceland, the village of Djupavik in the Westfjords, saw the development of a herring factory in 1935. The concrete building was the largest in the whole country at the time and housed state-of-the-art machinery to process fishmeal and oil. It was apparently the “envy of producers across Europe” [djupavik.is] and completely changed the area which was uninhabited before the business was established. Unfortunately, the fishing stocks started depleting in the mid-1940s and the factory finally closed in 1954.

The cases where islands are acting as outposts of larger economic systems are numerous. Hashima Island, commonly called Gunkanjima - meaning battleship island - is another prime example. The undersea coal mines established there in 1887 transformed the island completely. Seawalls and land reclamation tripled its size. At its peak in 1959, the island population was 5'259 inhabitants and boasted an astounding population density of 83'476 people per square kilometre. In 1974, the depleting coal reserves caused the closure of the mine, and its inhabitants left the island within days. After over 30 years of abandonment, the island was reopened for tourists in 2009. Following the growing interest in it as a cultural object, it was approved as a UNESCO world heritage site in 2015.



Djupavik, Iceland



AS AN INSTRUMENT OF RESEARCH

Islands were not only a source of inspiration for fictional literature but also for scientific research. As said previously, islands can be viewed as condensed versions of the world that were able to evolve separately and where change can be observed in a contained manner – as in a laboratory. This specificity allowed Darwin – during his five-year voyage aboard the HMS Beagle in the 1830s – to conceive what would become his theory of evolution by means of natural selection. Indeed, during his trip to the Galapagos, he observed how a seemingly same species had developed considerably different characteristics on nearby islands, to the point where they could be considered as separate species. He said: “the most remarkable feature... is that the different islands to a considerable extent are inhabited by a different set of beings...” and concluded that they had done so by what he called “natural selection” or “survival of the fittest”. These observations clearly emphasise that islands are truly microcosms of our world, unique and isolated.

On the other hand, the sheer isolation of these landforms provided some nations with a playground for scientific experimentation – like the biological weapons program on Plum Island – or even a test ground for the Atomic bomb. The minimal requirements for the latter are described by Francesco Librizzi as:

“A protected anchorage at least six miles in diameter; it must be capable of containing the target fleet and the supporting fleet. An uninhabited site, or one that is nearly so. A location at least 300 miles distant from the nearest city. A location within 1,000 miles of a military base. Freedom from extremely cold and violent storms. Predictable winds that are directionally uniform at all altitudes between sea level and 60,000 feet. Predictable

water currents of great lateral and vertical dispersion; fast currents that avoid important fishing areas, steamer lanes and inhabited shores. Control by the United States.”

In 1946, Bikini island met all of these characteristics, which lead to the relocation of 167 Micronesian inhabitants, and the arrival of 42'000 soldiers, scientists, civilians, and other military personnel aboard 242 ships. A further 156 aircraft and 25'000 radiation recording devices arrived on the atoll, without forgetting the 5'400 animal test subjects involved in 23 nuclear detonations that ran over 12 years. In 1998, an IAEA advisory group was formed to determine the habitability of the land. They recommended the island should not be resettled under the current radiological conditions. By 2012 - 54 years after the last test denotation – the caesium-137 levels were close to the 15 millirem standard. The bikinians could therefore “return” to their land, but most of the population is now comprised of descendants of the originally deported population who have never lived there...



AS A PLACE OF EXILE

Whether close to shore, or thousands of kilometres away, many societies have used islands as places of social exclusion. During the eighteenth and 19th century, the British empire transported political prisoners and those convicted of petty crimes to Australia, when it was still viewed as an isolated and distant territory - as an island. Saint Helena – considered one of the most remote islands in the world - was used for the same purpose by the British during the 19th century. Napoleon and Dinuzulu kaCetshwayo – leader of the Zulu army – were among the people exiled there. Another notorious example, just a few kilometres from the San Francisco shore, is Alcatraz Island which was used for 30 years during the 20th century as a maximum-security prison.

Poveglia, situated just 5km from Venice, is an example of how malleable islands can be. It served multiple purposes throughout history. The Venetians built a fort there in order to protect and control the entrances to the lagoon. After that, in 1776, when it came under the jurisdiction of the Public Health Office, it momentarily became a checkpoint for goods and people travelling to and from Venice by boat, before being used as quarantine station against the plague in 1793. In 1922, the building was converted into an asylum for the mentally ill, but it was reported that the patients were driven even further into madness by the spectres and ghosts of the unquiet dead from the plague. Whereupon, the island was abandoned for decades and was believed to be haunted. In 2014, it was sold to a wealthy businessman who plans to transform it into a luxury hotel resort.

AS A SOURCE OF OTHERNESS

Excursions for leisure used to be reserved to a select few for whom it was a serious intellectual endeavour. By the 19th century general opinion had evolved, and it was believed that the idea of “tourism” should not be limited by social class. It should be seen as a “counterpart to, and compensation for, labour.” [Simpson, 2017]; an escape from the stress and hardship of one’s daily life in search of an isolated place often possessing Arcadian qualities. The island became a symbol of this newly developed concept, and now plays a key role in the “global tourism imaginary”.

The 20th century tourist went to islands in search of otherness, for its primitive nature, and its uncontrollable forces, but they also represented – in their daily lives – a potential retirement place. Somewhere to escape to from society and to rebuild themselves. Somewhere independent from the continent. Yet, the build-up of this need for islandness until today, slowly eroded the material support on which they rely. Indeed, in the last decades, many islands and their communities have caught up with modernity. [Péron, 2012] The development of the tertiary sector to the detriment of previous types of labour have made them dependant on outsiders, on tourism. Thereby changing the dynamics of the island and its landscape. Although island communities retain their individualities and values – mainly non-physical aspects – their image is losing some of its appeal. They are not autonomous and isolated objects anymore but rather like “economic outposts” of tourism serving the mainland. In this context, what will be the island of tomorrow capable of filling this gap?

“Vacations remain one of the few manageable utopias in our lives”

Orvar Löfgren, 1999



CHAPTER 2:
**ARTIFICIAL
ISLANDS**

INTRODUCTION

The first Portuguese explorations and discoveries began six hundred years ago. It was a time when we used to look up at the stars for points of reference by using sextants aboard our wooden ships. We have now sailed, mapped and conquered the entire globe, and have begun to see it as an object; one that we look at from the outside, from a god's eye view. Recent artificial island developers respond to this perspective by shaping them for the "Google Earth armchair traveller" [Jackson, 2009] wandering the world through gestures and clicks.

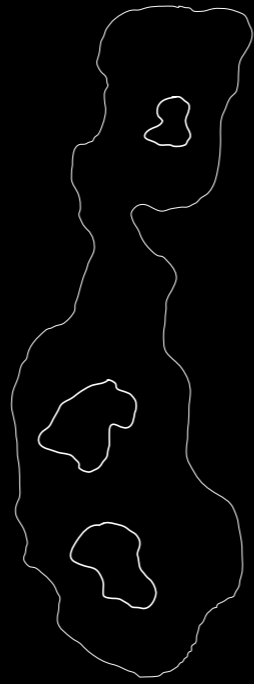
Man-made islands are not a recent typology, but since the turn of the century, they are assuming global proportions [Koolhaas, 2007; Jackson, 2011]. Technologically advanced, spectacularly shaped, and visible from space, they have become cultural icons in a search for a new global identity.

The selection of artificial islands in this chapter highlights how much their purpose has evolved through time, from a mono-functional landform to something similar to otherworld fantasies. As a result, their form has also evolved to become more of a work of art, in line with the image of these paradise-like places.

"The West suffers a double neglect toward this land of opportunity: a refusal to take seriously something actually originating in the West, and, subsequently an inability to detect a rising global phenomenon... The gulf however is not just reconfiguring itself, it's reconfiguring the world"

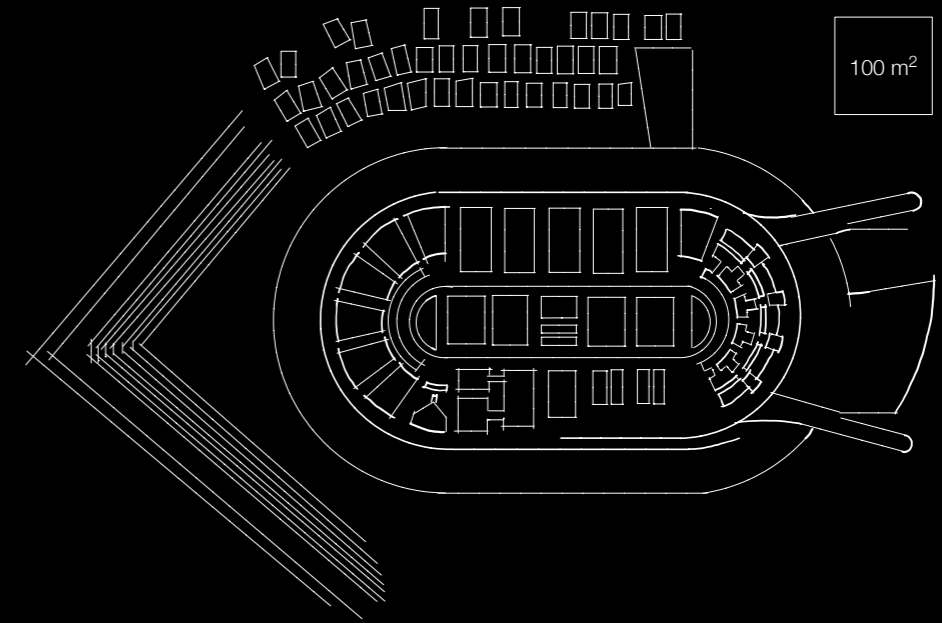
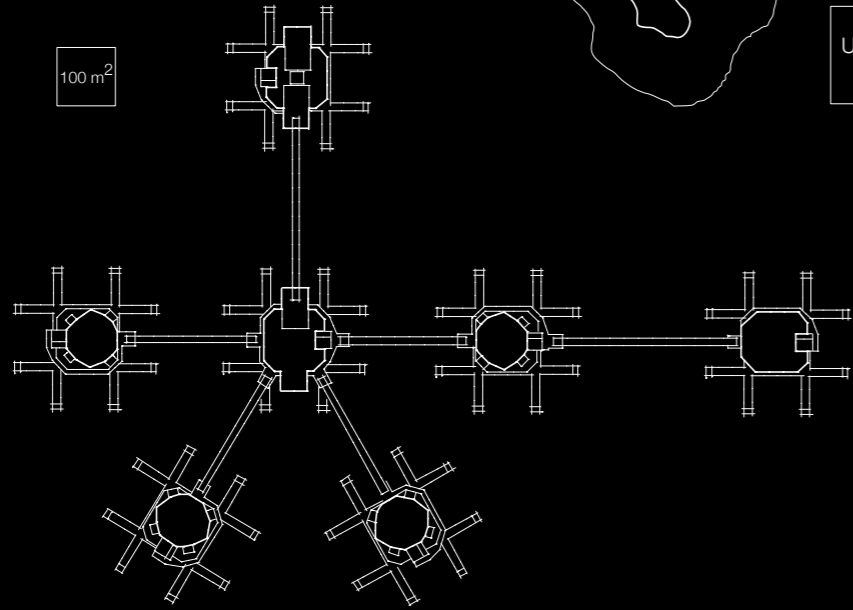
Rem Koolhaas OMA, the Gulf, 2007

10 km²

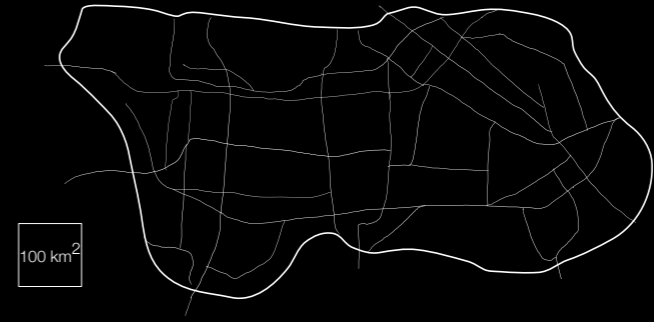


Unkown Scale

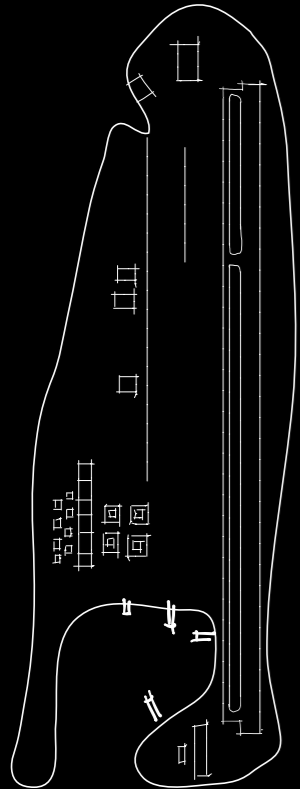
100 m²



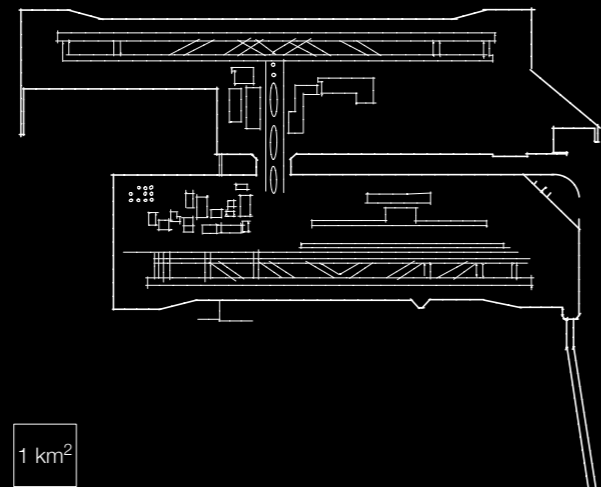
100 m²



100 km²



1 km²

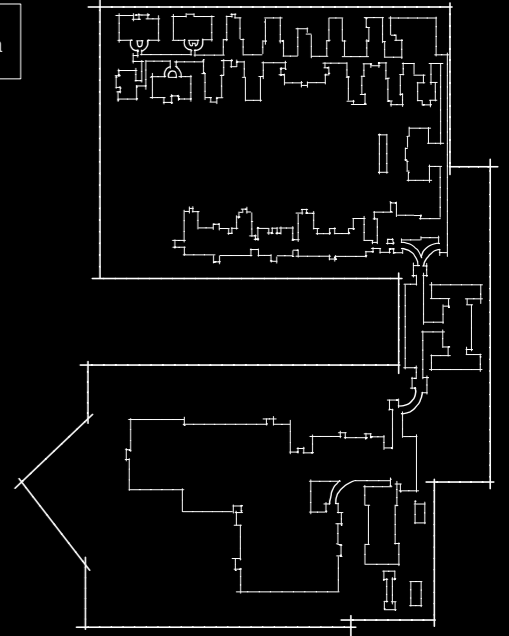


1 km²



1000 m²

1 ha



PURPOSE

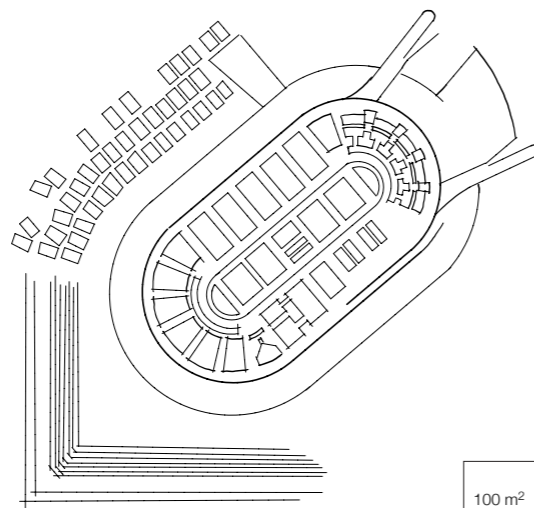
The choice of artificial islands described in this section will offer an overview of the wide-ranging roles they have had throughout history, but also emphasises their mono-functionality. Indeed, most of these man-made objects were built to defend or better exploit a territory. They will be sub-divided into four parts, similar to the ones found in chapter 1: an artificial island as a means of control, as an economic outpost, as an excised infrastructure, and finally, as a source of otherness.

AS A MEANS OF CONTROL

Historically, artificial islands were most often built for territorial control, like Fort Boyard. The distance between l'île d'Aix and l'île d'Oléron, off the French western coast, and the limited range of the artillery at the time, left a passage for the Royal Navy to attack Rochefort arsenal. Although the idea of constructing this fort dates back to the 17th century, it was only built in 1857. Unfortunately, by that time, the improvements made to weaponry meant it had become obsolete, hence its French nickname "Le fort de l'inutile".

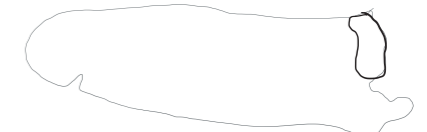
During World War II, while the Germans were improving their attacking force in the form of larger and faster aircraft, the British sought to protect Her Majesty by improving their defences. The Thames Sea Forts were part of an anti-aircraft defence strategy designed by Guy Maunsell and built in 1943. The metal structures were prefabricated and assembled onshore before being floated out into position, a few kilometres from the coast. The many forts, spread along the British shoreline, were equipped with powerful searchlights and radar which allowed them to gun down enemy aircraft before they reached the coast.

Nowadays, this usage of artificial islands has nearly disappeared, and most of these defence structures have fallen into disuse, or have been converted into hotels, tourist attractions, television settings, and more. Despite this, China has been reclaiming what has come to be known as the Great Wall of Sand. Since the instauration of maritime boundaries and exclusive economic zones in 1982, many countries have been fighting over these limits. As a result, the United Nations Convention on the Law of the Sea states that: "Artificial islands, installations and structures do not possess the status of islands. They have no territorial sea of their own, and their presence does not affect the delimitation of the territorial sea, the exclusive economic zone or the continental shelf." Despite this, China has been building man-made islands on seven reefs throughout the South China Sea and does not acknowledge the United Nations' 2016 decision relating to their non-island status. Furthermore, satellite imagery from 2017 has shown that the man-made islands are being equipped with state-of-the-art anti-aircraft guns and other weaponry.



Fort Boyard. Built in 1857

100 m²



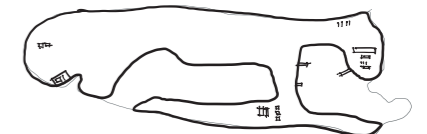
Fiery Cross Reef Reclamation. September 2014



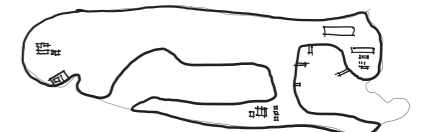
Fiery Cross Reef Reclamation. November 2014



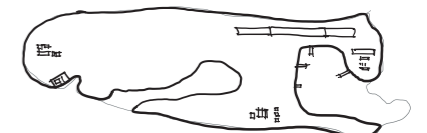
Fiery Cross Reef Reclamation. December 2014



Fiery Cross Reef Reclamation. February 2015



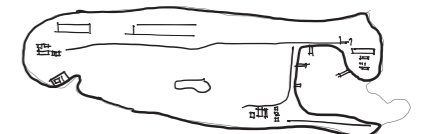
Fiery Cross Reef Reclamation. March 2015



Fiery Cross Reef Reclamation. April 2015

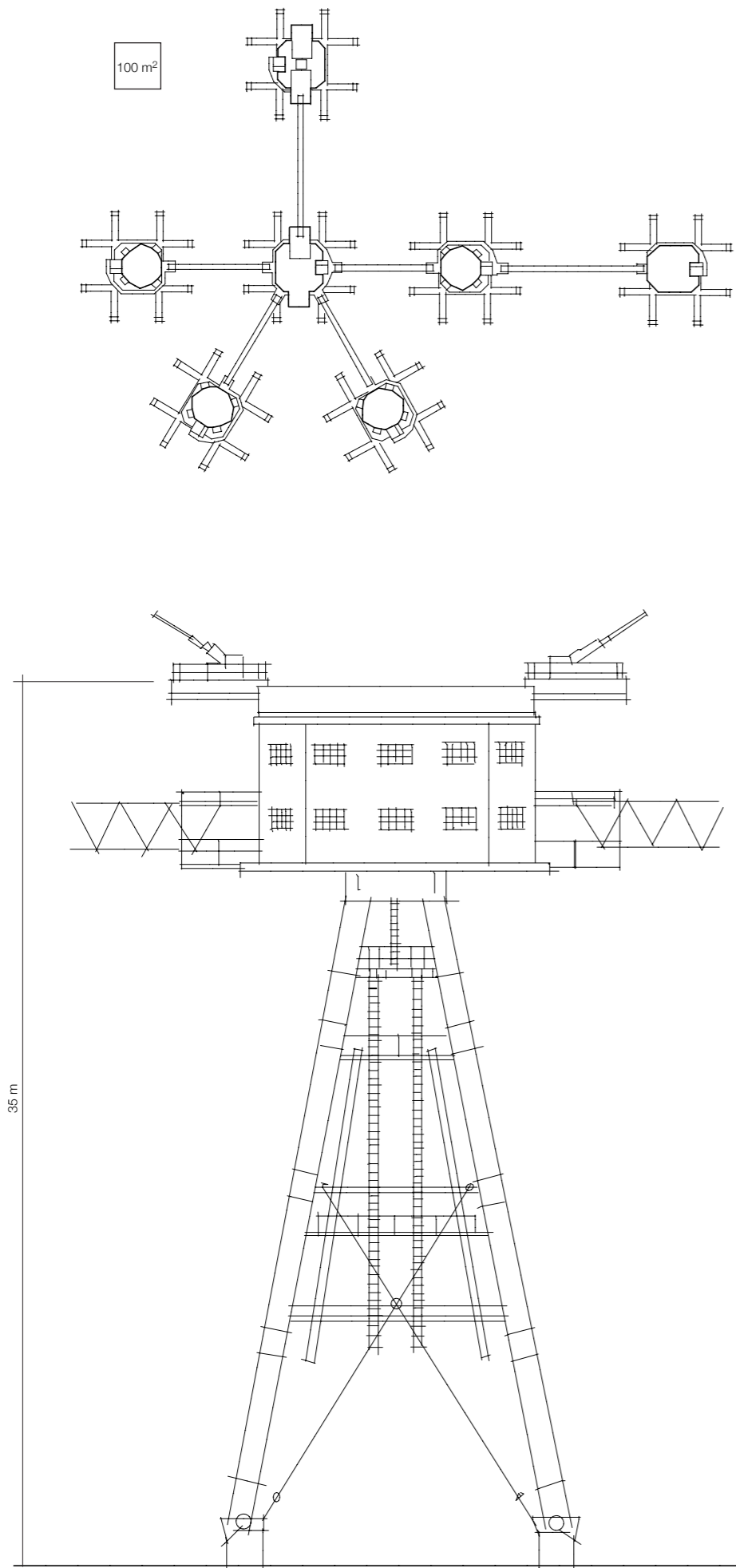


Fiery Cross Reef Reclamation. April 2015



Fiery Cross Reef Reclamation. Mai 2015

10 km²



Unknown. Maunsell Sea Forts. 1943.

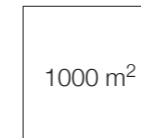


AS AN EXCISED INFRASTRUCTURE

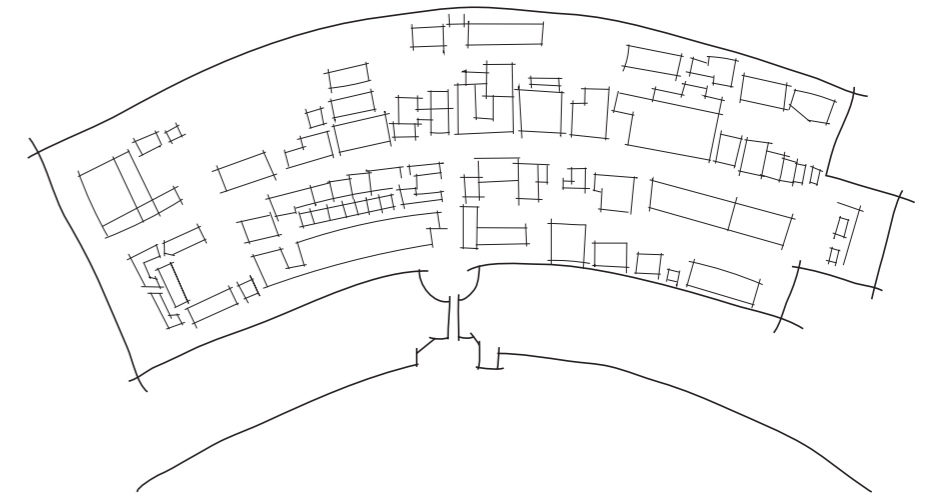
Additionally to defence structures, there have been other reasons for building artificial islands. In 1634, during the isolationist Edo period in Japan, Dejima was formed in the Bay of Nagasaki. For over two centuries it was the only trading place between Japan and the outside world, and was designed to keep the foreign merchants separate from the mainland population. It was later integrated into the city through land reclamation.

On the other side of the world, and towards the end of the 19th century, Ellis Island was built in the Upper New York Bay as a migration gateway to the United States. It was the busiest immigration station across the country for over 60 years, so much so that an estimated 40 percent of all U.S. citizens today can trace back at least one of their ancestors to Ellis Island. Today it has become a museum of immigration.

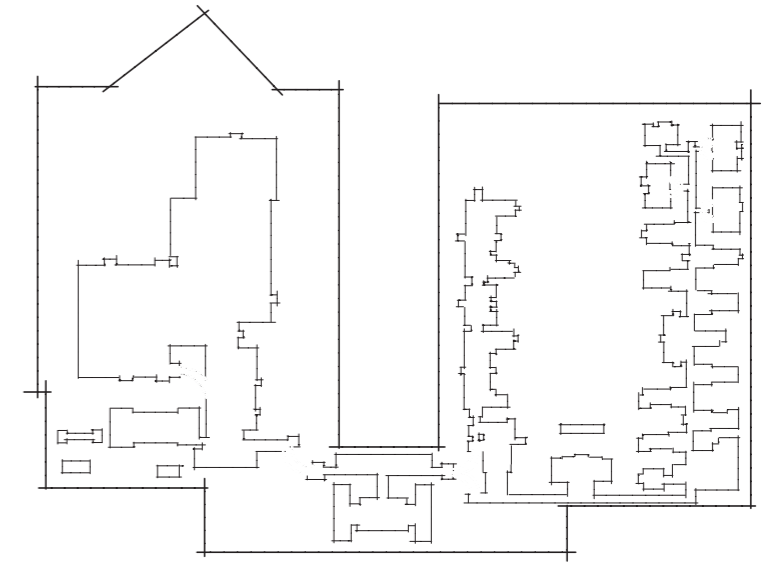
More recently, the lack of space in densely populated urban areas pushed large infrastructures – such as airports and shipping ports – out of the city, and sometimes, out at sea. Kansai Airport was opened in 1994 in the middle of Osaka Bay. It is a prime example of these large infrastructural islands developed by man within the last decades. It became the most expensive civil engineering project in modern history, with twenty years of planning, three years of construction and costing over twenty billion dollars, as of 2008; partially due to the unexpected sinking of the island. Despite this, the project was awarded the *Civil engineering Monument of the Millennium* for the challenges it overcame by building an airport in twenty-meter deep waters, and on soft Holocene clay (which is 70% water), and in an area subject to earthquakes.



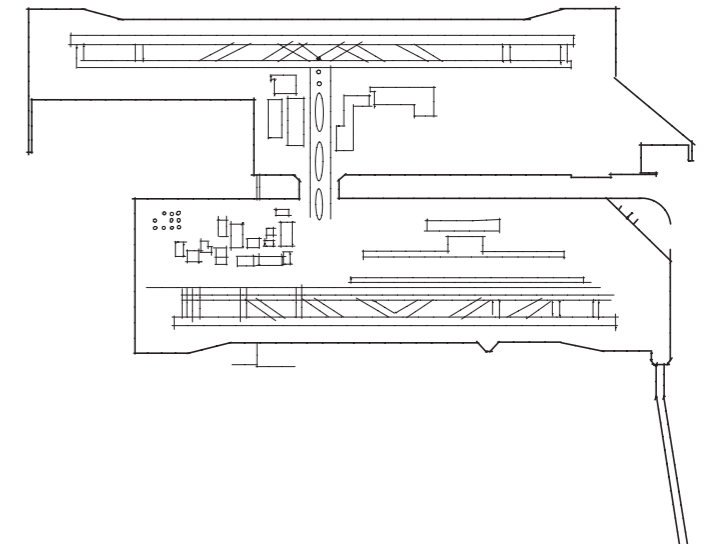
Dejima, Nagasaki. 1634



Ellis Island, New York. 1892



Kansai Airport. 1994



AS AN ECONOMIC OUTPOST

During the second half of the 20th century, the development of new technologies allowed man to exploit territories evermore remote. The offshore structures created by the Oil & Gas industry crystallise the extraordinary innovation of a whole era. Often ignored, sometimes criticised, they have become proud icons for some communities, a testimony of their skill, and a major part of their history. As such, it is not astonishing to learn that Norway has listed Ekofisk - one of the largest offshore complexes in the North Sea - as part of their cultural heritage.

However, many of them are falling into disuse, and a new era of decommissioning has started which poses numerous questions. Should these cultural objects really be dismantled knowing that many of them have become home to an impressive biodiversity? Indeed, their structures act as ideal vertical reefs for the fauna. If kept, how could they be reused or integrated to new systems?

All of the artificial islands seen to this point have in common their mono-functional usage and were never intended to be anything more than that. None of them aspire to become autonomous objects reminiscent of island utopias discussed in chapter one.



A SOURCE OF OTHERNESS

Rem Koolhaas once described Coney Island as a laboratory for “strategies and mechanisms that later shape[d] Manhattan” into a model of the 20th century city. In a similar way, recent artificial island projects are also acting as laboratories that create new types of social spaces. While Coney Island successfully tackled challenges of population density, prototype skyscrapers, night-time illumination, and “defined completely new relationships between site, program, form, and technology” [Koolhaas, 1994], artificial islands in the Persian Gulf and elsewhere around the world are testing novel spatial forms of enclosure, exclusivity and control, which might be embraced and applied as models of urban development elsewhere in the future.

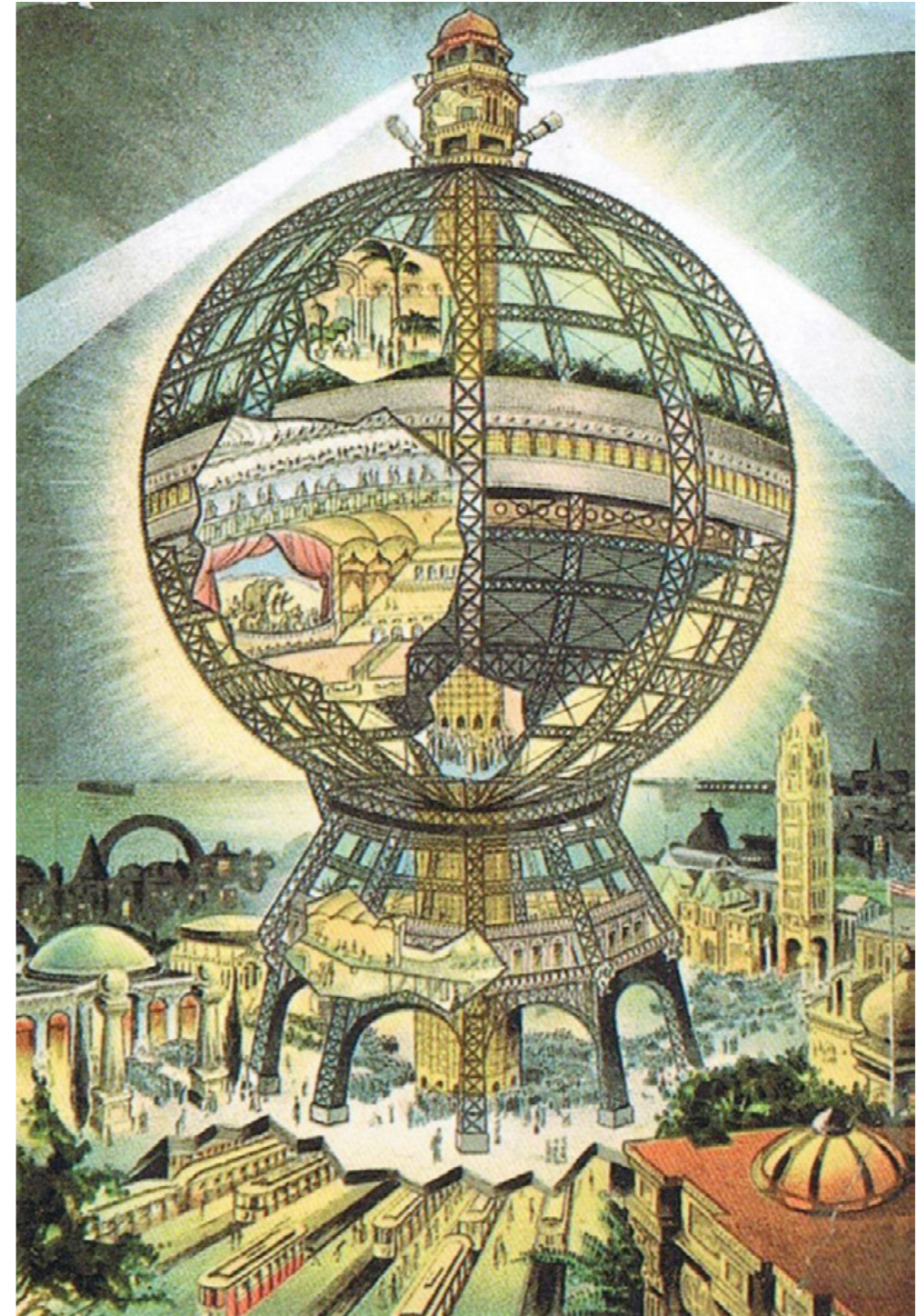
The World archipelago, also in Dubai, is “literally a cartographic utopia” [Della Dora, 2017] available to millionaires who cannot resist the opportunity to “play God” and shape an island to fit their every desire. It is the ultimate gated community. Dubai’s new islands are utopian hybrids of nature and technology characteristic of a world rendered urbanised: a world where even the furthest territories like “the world’s oceans, alpine regions, the equatorial rainforests, major deserts, the arctic and polar zones, and even the earth’s atmosphere itself, are increasingly interconnected with the rhythms of planetary urbanisation at every geographical scale, from the local to the global.” [Brenner and Schmid, 2011] While other projects around the world seem to have been put on hold for the time being – like the federation islands in Russia - China is going forward with its own project. The 24 billion USD Ocean Flower Island, under construction off the coast from Danzhou, is set to be finished by 2020. (see 2017 satellite image attached) It will incorporate 58 hotels, 23 recreation projects, 28 characteristic museums, 6 commercial streets, 7 folklore performance squares, a marine world and water park, an amphitheatre, an arboretum, the largest convention centre in the world, a seven-star hotel, an opera house, a film and art centre, a European-style castle, a massive central park, shops,



Google Earth satellite view. Ocean Flower Island. 2017.

sports fields, shopping malls, luxury housing, and more. The description seems to paint a condensed and autonomous version of the world, one where its inhabitants have no need to leave its perimeter.

Are these man-made islands a metaphorical response to a world that is presently mapped in its entirety, and consequently void of any traces of unknown territories? Where the utopian island has had to shift “from the register of the ‘found’ to the register of the ‘made’” [Sloterdijk, 2005].



Koolhaas, Rem. Coney Island Globe Tower. 1997

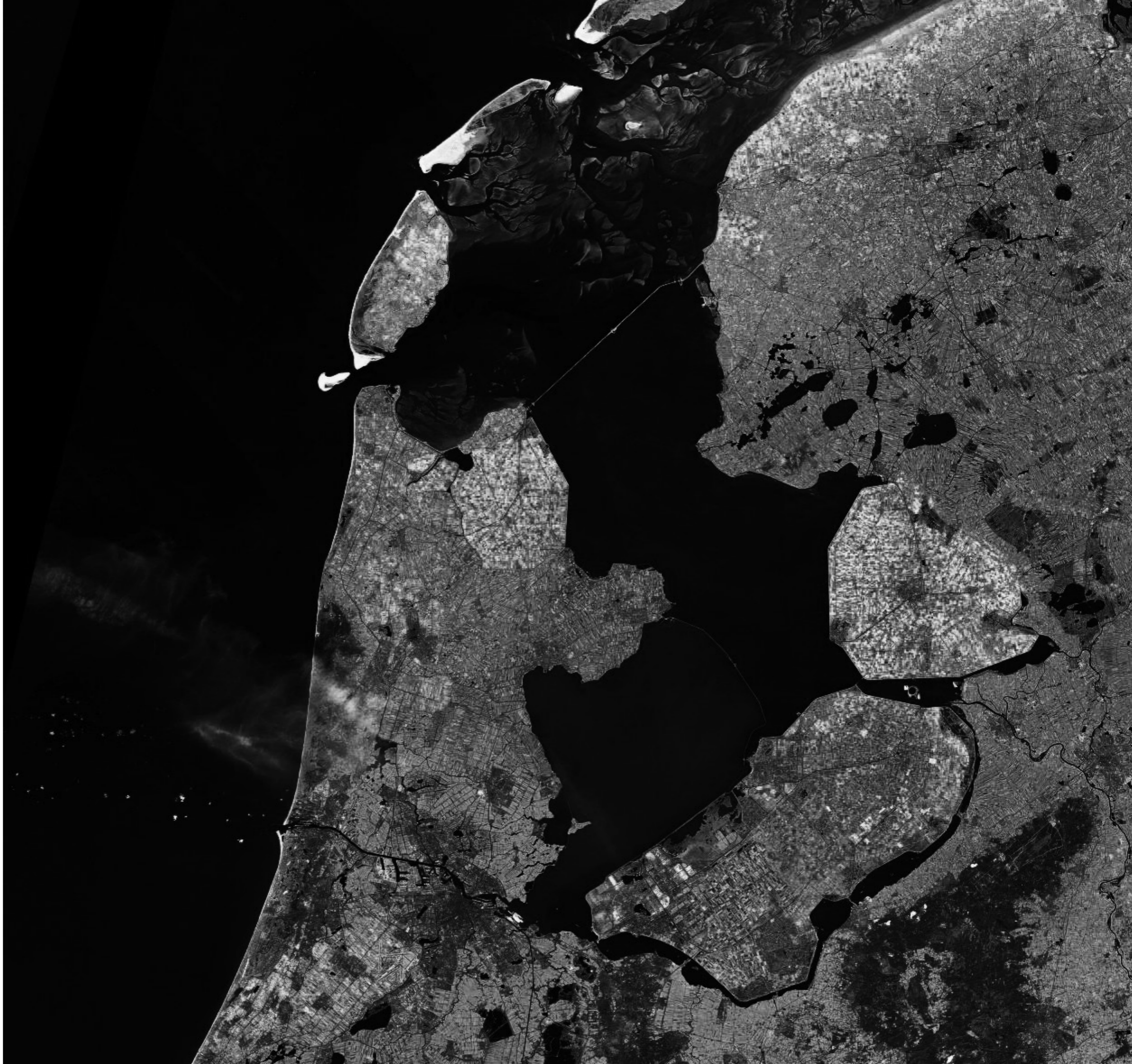
FORM

Aside from their purpose, artificial islands have been shaped to a wide variety of forms within the last decades. From close-to-perfect rectangular landforms, to metallic structures passing by palm-shaped sandbanks. What drives this variety, and how does it influence the direct environment in which they are set? The approaches will be categorised as being either contextual, functional or symbolical.

CONTEXTUAL

Some artificial islands can be considered as contextual, in the sense that their form or building process is tightly linked to their context. Flevoland in the Netherland is considered the largest man-made island in the world. Unlike others, it was not obtained by addition but rather by subtraction. In other words, the landform did not rise above the water level, but the water was removed to reveal the land. It is part of the Zuiderzee Works, named as one of the Seven Wonders of the Modern World relative to civil engineering achievement of the 20th century, a system of dams and dykes and water drainage. As such, it would be hard to describe a more contextual approach, since the resulting topography is literally the context itself.

Another example would be that of the Uros people who created their own vernacular architecture on Lake Titicaca in Peru. Here the contextual approach can be seen in the process, the native building knowledge and use of local materials. Originally for defensive purposes, the Uru people retreated onto the lake by fabricating raft-like islands made of a local aquatic plant named totora that only grows at very high altitudes in this region of the world. [Bixler Heiser, 1992] The encyclopaedia of Vernacular Architecture of the World defines vernacular architecture as: "...comprising the dwellings and all other buildings of the people. Related to their environmental contexts and available resources they are customarily owner- or community-built, utilizing traditional technologies." This seems to evoke precisely the artificial islands created by the Uros.



FUNCTIONAL

On the other hand, some artificial islands do not seem to respond to their context on any level. They could be repeated around the world without ever changing form. They are driven by something else - efficiency. This approach could be labelled as functional: their shape is the result of the island's purpose. For instance, Kansai airport is a geometrical shape defined mainly by the runway and the linear alignment of the buildings along it and discards any unnecessary fluctuations of its limit.

The Maunsell forts built in the Thames estuary as defensive objects during the second World War adhere to similar principles of efficiency, and in this case, of reproducibility. They were prefabricated towers that could be shipped out into place. They were actually replicated several times along the English coast. In a similar way, one could mention offshore platforms. They come in different shapes and sizes, some float, some are fixed, but essentially, they are all testimonies of the most efficient technologies available at the time of their design. They are extremely precise objects, similar to a watch movement, where every part is interconnected to another, and where the superfluous has no place.



SYMBOLICAL

Finally, some artificial islands do not adhere to either of the categories cited above. Their form seems to be motivated by something other than context or function. This last type can be described as symbolical. These artificial islands are fairly recent developments, such as the Palm and the World islands in Dubai, and the Ocean Flower Island in China. Their shape is respectively that of a palm tree, a cartographic map of the world, and a flower. They are only visible from the air, or to the "google earth armchair traveller". Yet, this choice has seduced many. The attraction seems to be the very idea of owning part of such a symbol. A symbol that embraces the artificialness of the island to its full extent, and acts as a global icon, where little of the island imaginary is visible, except the exclusiveness.



PRELIMINARY CONCLUSION

The artificial islands studied to this point seem to have left aside a key characteristic of islandness emphasised in chapter one: self-sufficiency. The second concern is the lack of environmental research regarding the context in which the islands are built.

The idea of a self-sufficient community described in More's Utopia, was not present in the making of artificial islands until recently. Migration gateways, military forts, airports, shipping ports, wastelands, polders, are all extensions of the territory and never act as a distinct and independent entity.

The logo islands in Dubai, and the soon-to-be Ocean Flower Island in China, despite also being territorial extensions, provide their inhabitants with a kind of illusion of autonomy, of living in an idyllic landscape detached from the mainland that could somehow exist without it. The reality is far from that, the Palm Islands are linked to the coast with a massive five-lane motorway, like an umbilical cord, still providing all the necessary nutrients. The more recent development, modestly named "The World", provides a more convincing illusion of independence. Four kilometres offshore, it isn't even visible from the beach, and no obvious infrastructure links it to the mainland. Underwater pipelines and cable were meant to provide the islands with water and electricity but their construction was put on hold during the 2008 crisis and were never built. Since then, there have been proposals to build a motorway to the archipelago to revive the project, and thereby killing part of the illusion. Cruise ships are probably closer to the utopian idea of self-sufficiency and independence than any other object today. But ultimately, these are all places of consumption and not production. Should we strive to create this self-sufficient Arcadian utopia mankind has been obsessed with for centuries or accept the seemingly unavoidable inter-connectedness of our world where we have become dependent on evermore distant territories?

For now, one can only find this ideal autonomy in conceptual projects or in works of fiction like those by 2A+P/A in the San Rocco issue Islands depicting a self-sufficient artificial island designed for Francisco Scaramanga, the villain of Ian Fleming's *The Man with the Golden Gun*, capable of navigating the ocean and storing huge amounts of solar energy. There are projects from the Sea Steading Institute developing floating island modules that could link together to form a city out at sea, self-sufficient and politically



2a+P/a. The Island of the Man with the Golden Gun. 2011.

“– Good evening, Mr Scaramanga!

– Good evening.

– Please, take a seat. Would you like something to drink? A scotch?

– No, thanks. Is the island project ready?

– For sure, sir. It is.

– Let me see.

– Here you are. These are the drawings.

– Hmmm...

– As you can see, I designed a sequence of spaces that spreads over the entire island, whose interior is dug out in order to maintain the naturalness of the appearance of its surface. At the bottom there are all the technical spaces, including the machine room housing the engines and the access door for the submarine. However, the most important space is the solar energy station, the beating heart of the system. Believe me, sir, there is nothing like it in the whole world. The system works by means of thermo-electric generators that convert solar energy into electricity and super-conductivity coils that are cooled by liquid helium kept at a temperature of -453° Fahrenheit, absolute zero. Everything will be automated and, thanks to the Solex Agitator, your island will be completely self-sufficient, Mr Scaramanga.

– Very interesting, architect. How much energy can be produced using this technology?

– Well, it is not easy to calculate that with precision. We are talking about a technology capable of solving the energy crisis of the entire planet, sir. Thus the island could be a sort of prototype to be shown to all the world powers... The highest bidder could build hundreds of stations and sell additional franchises for even greater profit. You will literally have the sun in your pocket! A monopoly on solar power... And the oil sheikhs will pay just to keep solar energy off the market.

– The thought had occurred to me...

– Well, to continue, going upstairs we enter the first areas of the residential part of the complex: the hobby room, the funhouse and the sports hall.

– Great. I need to be trained for my job. I also need a Hall of Mirrors.

– Do you mean a room covered in mirrors?

– Exactly.

– No problem; we can dig one out in this area close to the funhouse. It wouldn't introduce any structural problems there.

– And inside it, I want a statue.

– Sure, sir. What kind of statue. A classic one?

– I want a statue of Bond.

– Do you mean the Bond? James Bond, the MI6 agent?

– Yes, exactly. We can say that he is one of my... obsessions. Go on, please.

– Right. Here we are in the main hall that faces the grand landscape of the archipelago, which will be visible thanks to these huge windows. The elevator connects it directly to the beach on the little bay.

– That's good. And the dining room?

– Ah, the dining room is conceived to enhance the view of Ko Tapu Island! In these spaces I would like also to make some rocks visible, you know, to unveil the natural character of the house. Then, through this door we go directly to the bedrooms, the most intimate area of the house. Here I designed a little living room and a study, private spaces where you can rest by yourself.

– As I said to you, there will only be two of us in this house: my loyal butler, Nick Nack, and myself.

– I see. But surely you will have a guest at some point...

– Sure, but only for short periods. Intense but really short ones.

– I see... Anyway, on the top of the island, there is the solar energy collection point. This steel device you see here is the collector. The Solex will transmit the heat to the thermal generators. Light will enter the sliding opening, which faces Ko Tapu Island, where we will install panels that lock onto the sun and then track it automatically. Reflected through the Solex Agitator, these panels will produce a heat of at least $3,500^{\circ}$ Fahrenheit!

– Very interesting . . .

– Then, this system is capable of storing such a great quantity of energy that, if it were properly focused, it could become a sort of energy weapon.

– That's what I call solar power! Well done, architect. The project is complete. So, I would like to settle your fee. Ready?

– Thank you, Mr Scaramanga. May I ask you what this is? It seems like a golden bullet... with my name incised on it. ...Sir?

– Exactly, architect."

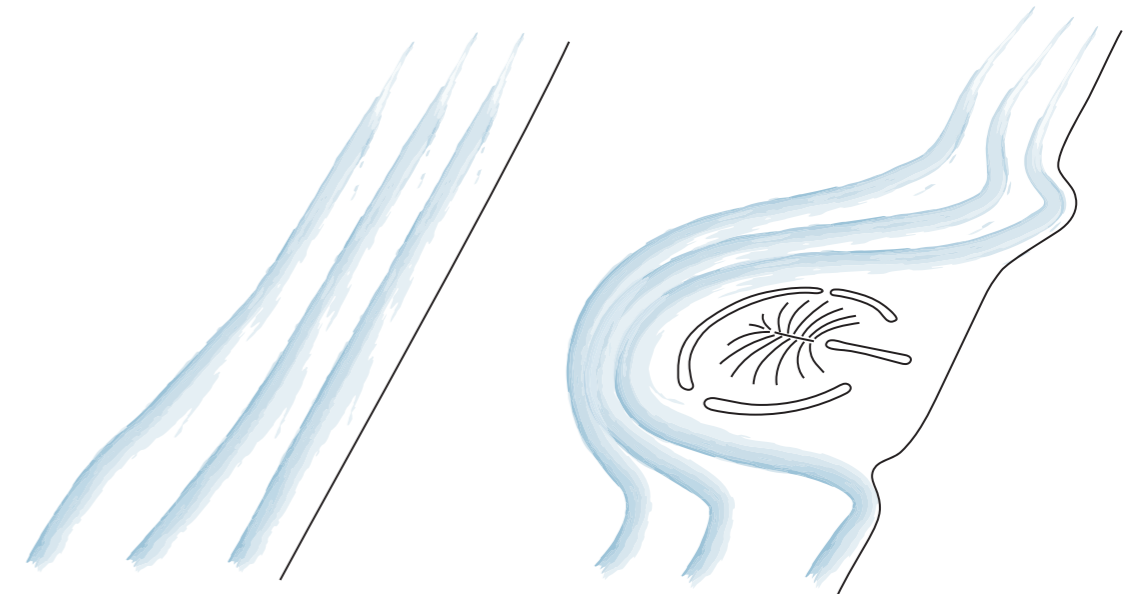
2A+P/A, *San Rocco Islands*

independent from any nation. Although it has gained in momentum over the past few years with the apparition of new technologies, it is still at a conceptual phase.

Lastly, as mentioned above, the seascape has rarely been a source of preoccupation in the designing of these landforms. It is still too often considered as an "endless extension of a uniform element" [San Rocco, 2011], as something empty, as a tabula rasa. Is the seascape not as worthy of consideration as the landscape from an architectural perspective?

For instance, the water flows in the Palm Jumeirah project were not sufficiently considered. The design not only caused stagnant water between the island and the breakwater, but it also triggered an extensive erosion along the coast. [see illustration] Offshore Oil & Gas platforms, and their pipelines, cause noise disturbance for kilometres around them which strongly affects wildlife. Kansai airport took into account environmental concerns over noise, and planned the flightpaths far away from the coast, above the sea, as if it would not affect anything in that area.

The following chapter will use an example of an artificial island project in the North Sea, under discussion since 2017, to exemplify these issues, and question whether this new island could become more than an energetic outpost.

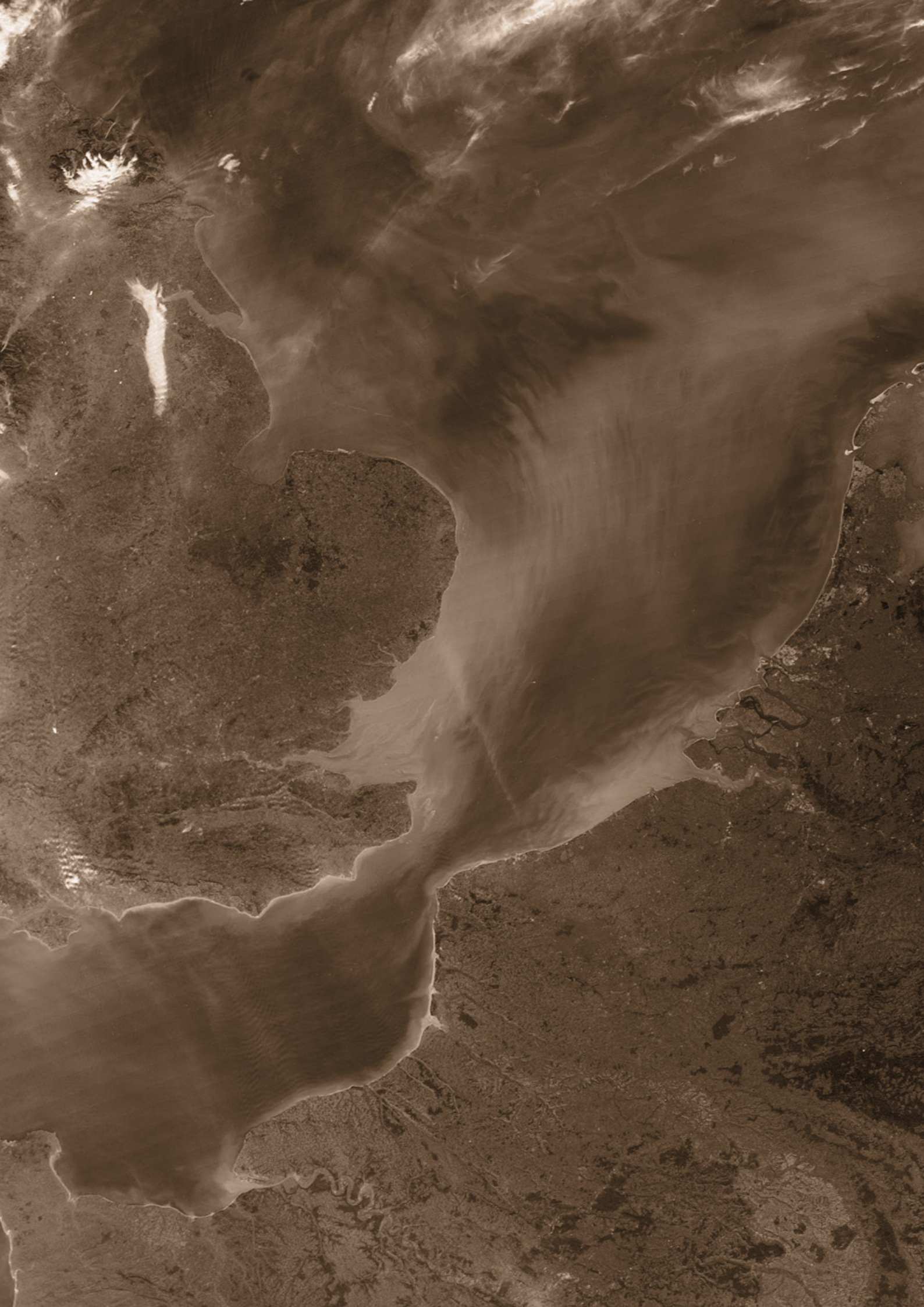


Water flow prior to the construction of the Palm Island

Water flow pattern after the construction of the Palm Island causing coastal degradation on either side



Espacio, Cero. A Church without God. 2016.



CHAPTER 3:
**THE NORTH
SEA ISLAND**

INTRODUCTION

The previous chapters have highlighted the importance our societies have bestowed upon islands and artificial islands alike. This chapter will focus on a project for an artificial island in the North Sea put forward in March 2017 by the Netherlands, Germany and Denmark, with the hope that others will join in time. The project is particularly interesting because it aims to tackle environmental issues, yet it is set to be built in one of the most industrialised seas in the world, which in turn raises many environmental questions relating to its effect on marine ecosystems and other dynamic uses of the sea. The territorial mapping will analyse the whole of the Sea as one entity, bringing together data that is often limited to a single country's Exclusive Economic Zone [EEZ]. It will expose how much this area is already industrialised, how much it desperately needs to be considered as a whole, and how the present morphologies might affect, or be affected by, the construction and planning of this new island.

THE NORTH SEA TODAY

The North Sea is shared among seven countries – the United Kingdom, Norway, Denmark, Netherlands, Germany, Belgium and France – and is the lifeblood of approximately 60 million people. [EU committee report] The diverse human activities employed around 850'000 people in 2015 and is set to increase with the development of large-scale renewable energy projects.

The first paragraph of a report published in March 2015 by the House of Lords European Union Committee, named *The North Sea under pressure: is regional marine co-operation the answer?* states: “The North Sea is one of the most industrialised seas in the world. While ships queue to progress through its southern channels, navigable space allocated to wind farms could, according to some estimates, increase fifty-fold within just a few years. At the same time, it is essential to develop coherent networks of environmentally protected areas and engage in the European Commission’s long-term plan to support sustainable economic growth in the marine sectors. We discovered that there is no single map or database plotting the various, often conflicting, uses of the Sea. [...] Cross-border energy co-operation in the North Sea has enormous potential,” and concludes with: “We recommend therefore, that the UK Government convene a North Sea ministerial conference in order to develop a holistic approach to all economic and environmental issues affecting the North Sea. Importantly, the conference should seek to deliver the urgently required political and strategic vision which will sustain this precious resource and secure it for future generations.”

The dynamic uses of the Sea were analysed in a report by Windspeed in 2015. It explains how complex these uses are, and how they are often overlapping with one another. Some areas in the North Sea have been zoned for both nature conservation and military use, have cables and pipelines crossing through them, and permit additionally to all this, shipping passage and fishing activities. This complicates the search for areas suitable for offshore wind farm developments. They need to be respectful to “non-wind” uses, as well as be appropriate for wind energy production. Yet, if properly developed, offshore wind energy could provide 30% of the electricity production of the North Sea countries.

- - - EEZ boundaries
- Aggregates locations
- Finfish mariculture
- Landing stations
- Communication cables
- Ports by size
- + Boreholes
- + Oil platforms
- + Gas platforms
- Oil pipelines
- Gas pipelines
- + Current power
- + Osmotic power
- + Thermal conversion power
- + Tidal barrage
- + Tidal stream power
- + Wave energy
- + Wind farms
- Noise disturbance
- Fishing density
- Natura 2000 areas
- Urban areas
- Bathymetric contours
- Topographic contours
- Dogger Bank contour



THE PROJECT

With this in mind, a project for an artificial island acting as an energy hub in the Dogger Bank area was agreed upon in March 2017 by electrical grid operators in Germany, Denmark and the Netherlands. They were joined by Gasunie [Netherlands] in September, and in December by Port of Rotterdam which will bring valuable knowledge in land reclamation to the consortium. The artificial island – or islands – would serve as a connector between all the new wind farm developments in the area, and distribute the electricity via direct current to the neighbouring countries.

More significantly, this system would enable trade between the energy markets around the North Sea, as well as allow for a significantly better maintenance of the infrastructures. Although the project is currently in the early stages of its development, it is projected for 2035 to 2050.

DOGGER BANK

Located in the centre of the North Sea, Dogger Bank is a sandbank within the Exclusive Economic Zone of the UK, Netherlands, Germany and Denmark – and just outside that of Norway. It is approximately 260 km long by 97 km broad, and totalling about half of Switzerland's surface. Its shallow depths – ranging from 15 to 36 metres - make it a perfect place for the development of offshore wind farms. However, it is also a prime fishing zone, part of it was added to the Natura 2000 conservation scheme in 2017, and lastly, some areas have already been developed by the Oil & Gas industry.

THE MAPPING

The mapping process will be divided into three main parts: the geomorphologies, that will include bathymetric, current and tidal maps; Environmental morphologies, that will include, Natura 2000 data and wildlife data if available; and lastly, anthropogenic morphologies, that will include shipping, fishing, Oil & Gas related activities, and marine renewable energy developments.

NORTH SEA DYNAMIC USES

| Function | Extent In 2015 | Future Development |
|---------------------------|---|---|
| Fisheries | extensive but not clearly demarcated | stable, with possible changes to techniques |
| Military areas | approx. 14% | stable |
| Cables and Pipelines | approx. 8% | moderate growth |
| Oil and Gas extraction | approx. 11% | decline through decommissioning |
| Sand extraction | approx. 2% | stable |
| Nature Conservation | approx. 13% | growth likely |
| Marine Wildlife | present everywhere but not clearly demarcated | uncertain |
| Shipping | approx. 10% - 25% (dependent on timeframe) | moderate growth |
| Other offshore renewables | presently negligible | growth - uncertain scale |

Table source: Roadmap to the deployment of offshore wind energy in the Central and Southern North Sea (2020 - 2030)



GEOMORPHOLOGIES

GEOLOGICAL FORMATION

The North Sea is a relatively young ecosystem. Since the last glacial peak 22'000 years ago, it has been subject to drastic changes. "Largely covered by ice at the beginning of the period, it became successively an artic-like tundra, a 'park-like' landscape of extended grassland with shrubs and trees, a tundra again, and a plain with light woodland cover that was submerged eventually by the expanding North Sea... The North Sea, throughout its history, has been a dynamic landscape par excellence." [Van de Noort, 2011] The map below details the development of the North Sea at four points in time.

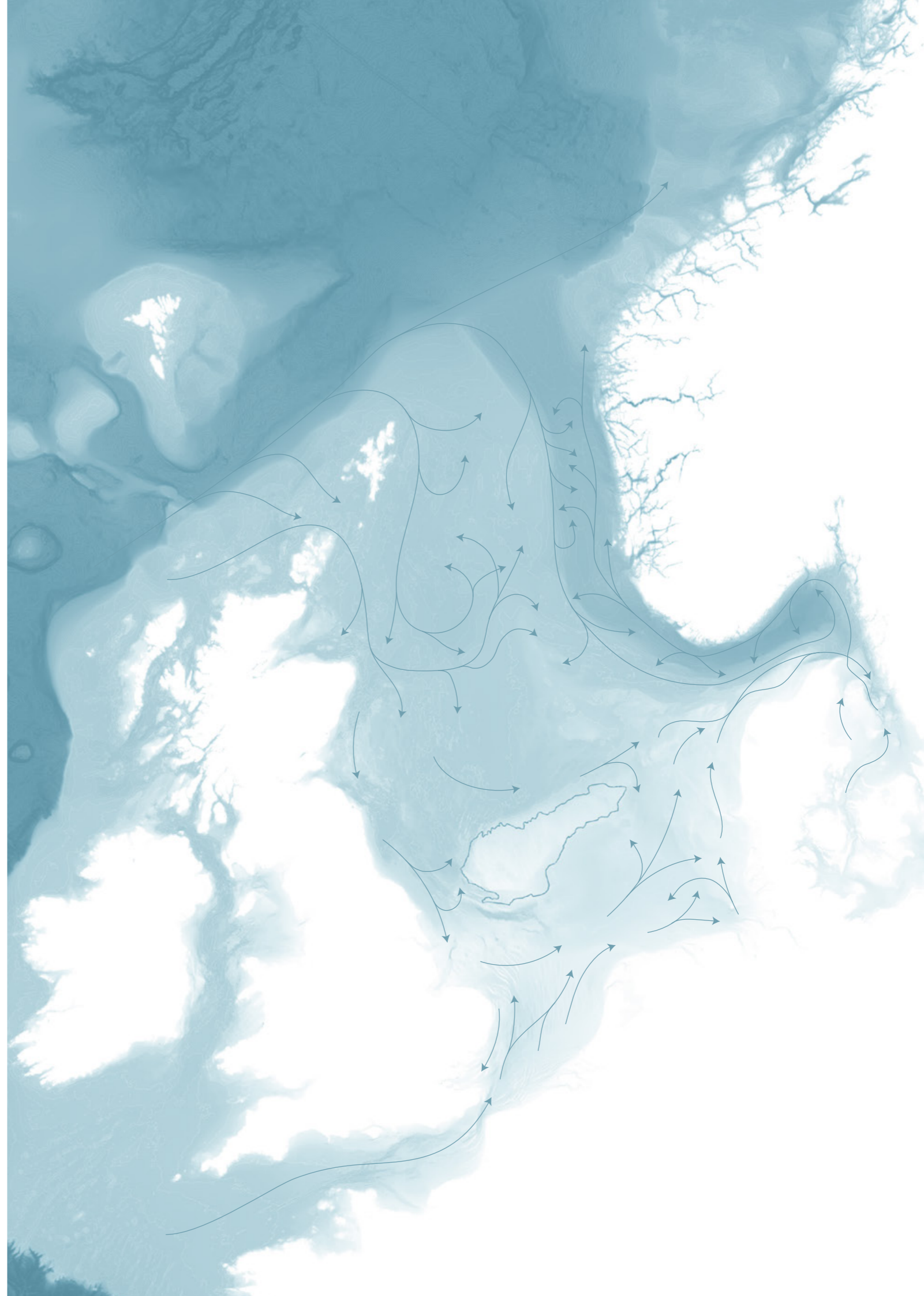
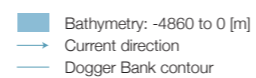


BATHYMETRY, CURRENTS AND TIDES

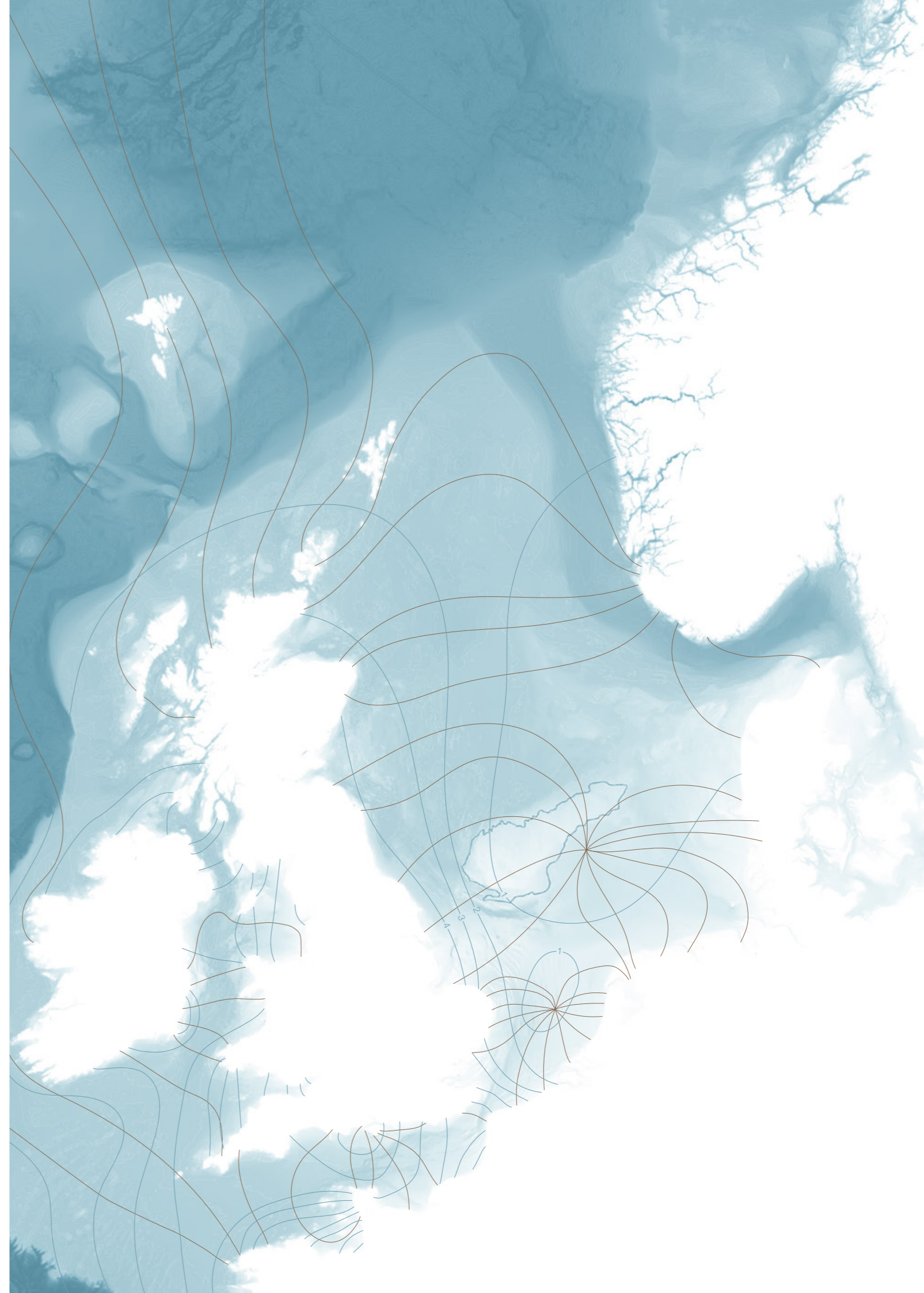
The basin is very shallow, which is a major reason why it has become so industrialised. The southern part, delimited by Dogger bank to its north, is roughly 50m deep all around. The bank varies approximately from 15m to 36m of depth, whereas to its north, the sea slopes down gently to 100m, whereas to its north, the sea slopes down gently to 100m, before sinking to 750m in the Norwegian Trench along the South-Western coast of the country.

The water currents in the North Sea are overall anti-clockwise. They flow southwards along the British coastline to Belgium where an additional current from the channel joins in, before heading east towards Denmark, and finally up the Norwegian coast. The main inflow is from the North Atlantic along the shelf break near Norway. The currents can sometimes differ from this generic representation and separate into two subsystems divided by Dogger Bank. This can have strong effects on the biodiversity – such as the circulation of zooplankton and the transportation of fish eggs. This is only one example of the many interactions between the different dynamic morphologies in the North Sea, which is why it is important to have as little impact on them to avoid ramifications.

The map on the following page, explains the tidal nodes in the North Sea. Tides are not uniformly dispersed around the globe. Around tidal nodes, the height variation is zero, and the amplitude increases with distance from said node. In this case, we can see a tidal node – defined by the brown lines – just beside Dogger Bank. This can have an important impact on the potential location of an island for erosion reasons.



- Bathymetry: -4860 to 0 [m]
- Tidal nodes
- Tidal amplitude [m]
- Dogger Bank contour




ECOLOGICAL MORPHOLOGIES

FAUNA AND NATURA 2000

Natura 2000 is a network of nature conservation areas. It includes both terrestrial and marine environments. As shown on the adjoining map, the protected areas in the sea are more loosely defined and considerably larger than their terrestrial counterparts. Interestingly, many of them were only added to the network in 2017, now that every user of the North Sea is trying to secure areas for their own benefit.

The Dogger Bank area is listed as a conservation site, for it is deemed 'exceptionally representative' of "Sandbanks which are slightly covered by sea water all the time for which this is considered to be one of the best areas in the United Kingdom." [Natura 2000 form] And additionally to this, it is described as a "non-vegetated" area home to mainly three species: the grey seal, the harbour seal, and the harbour porpoise. The outcome of the assessment is not clear regarding the degree of conservation and the protection measures to be put into place. But there are already several renewable energy developments in the area, as well as offshore gas platforms, which seems to indicate a low degree of conservation or lack of clear guidelines.

The partial absence of geographical information for marine species covering the whole of the North Sea has not permitted an integration of this information to the mapping process. Further contact with government agencies would be needed.



Natura 2000 areas
 Bathymetric contours
 Topographic contours
 Dogger Bank contour

ANTHROPOGENIC MORPHOLOGIES

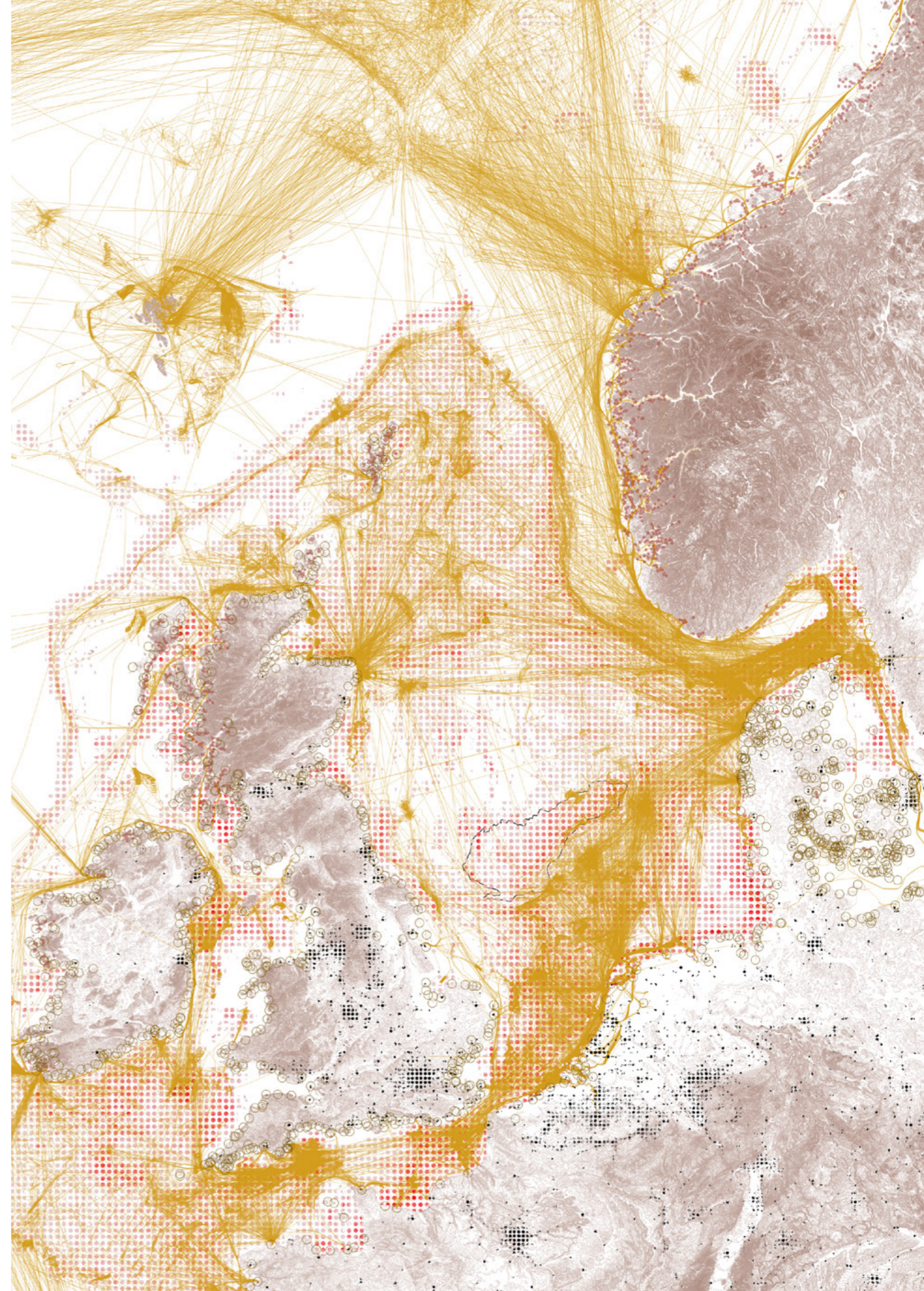
FISHING INDUSTRY

The North Sea has long been a hinterland for its surrounding countries, proven to be one of the most important fishing grounds in the world [Walday, 2002], thanks to the strong presence of benthic and pelagic communities. Salmon, sturgeon, rays, shad, and skates were common in the area during the 20th century, but since then their numbers have declined due to overfishing and other anthropogenic activities.

The adjoining map illustrates with a dotted pattern the fishing density in the North Sea in January 2015, and in overlay, the routes completed by fishing boats in September 2017. The latter highlights strong nodes along the coast, and seems to show a decrease of fishing in the Dogger Bank area – but this might also be due to the different seasons during which the data was taken. The hollow circles represent the fisheries first sale locations, while the burgundy dots – mainly visible along the Norwegian coast – characterise the locations of finfish mariculture.

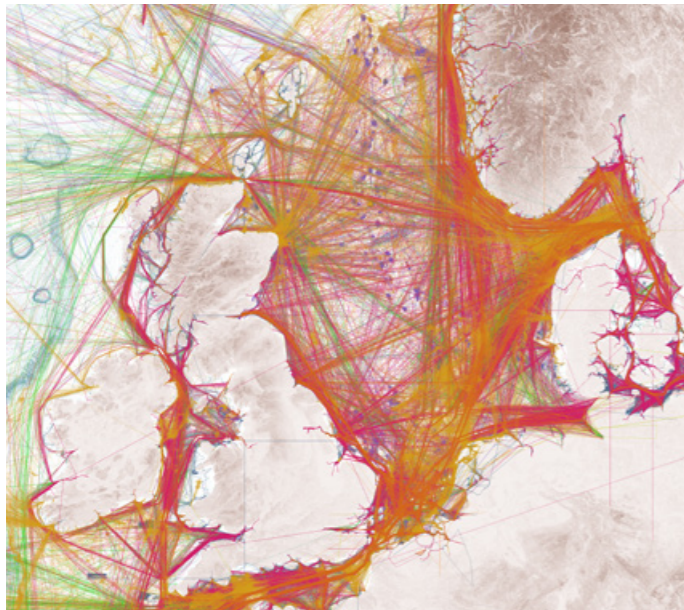
All shipping data is relative to the period of September 2017

- Finfish mariculture
- Fisheries first sales
- Fishing density
- Fishing dynamics 09.2017
- Urban areas
- Topographic contours
- Dogger Bank contour

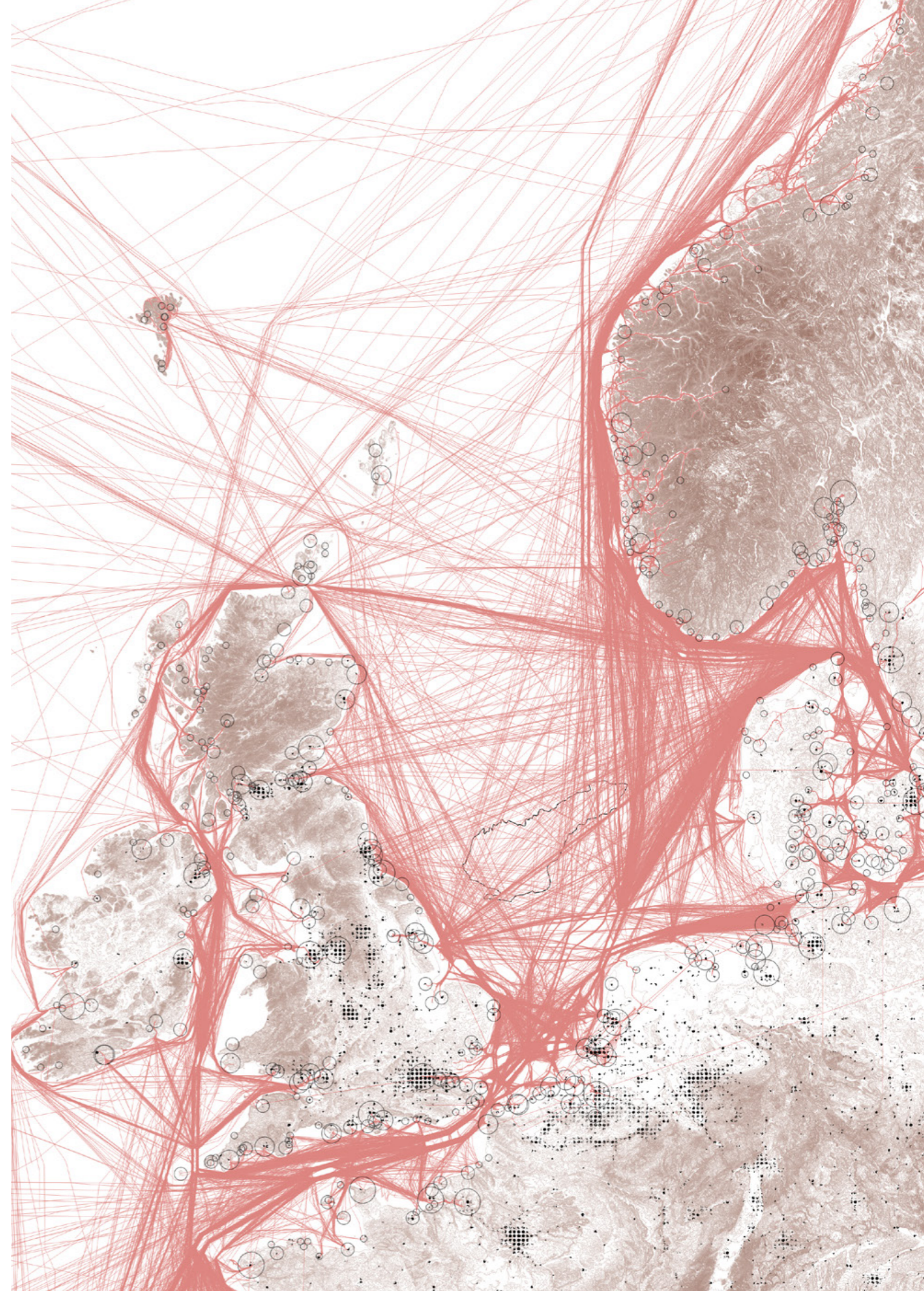


TRANSPORTATION

According to the UN-Business Action Hub, over 90% of the world trade is transported by sea, and ports around the North Sea are among the largest in cargo capacity in the world. As a consequence, it is one of the busiest maritime areas around the globe, not only because of its large ports, but also because of the significant through traffic from the Baltic Sea. The following maps express these constant movements of goods and people across the sea, and the nodes of anchorage they create along the coast. Each of them express a different story in the most explicit way. While the map of general cargo shipping conveys the sheer volume of these ships crisscrossing the sea and highlights the numerous ports affected, the map of passenger movements pinpoints precisely a few ports and forms a kind of stitching, that binds the countries together. The map on page 71, depicting offshore supply and services, manages to reveal all of the artificial islands lost in the apparent vastness of the sea. Unlike the following one that illustrates the Oil & Gas morphologies in a united manner, it shows the scission created by the exclusive economic zones of the surrounding countries – a non-cooperative exploitation of the sea. Altogether, they speak of the complex dynamics present on the surface of the North Sea.



- Other Offshore service
- Offshore supply
- Passenger
- General cargo
- Ports by size
- Urban areas
- Topographic contours
- Dogger Bank contour





OIL & GAS INDUSTRY

The Oil & Gas industry developed in the early 1970s. Norway and the UK quickly became leading experts around the world in this field. The industry employs more than 300'000 in the UK alone and covers over 75% of the country's primary energy needs.

At a first glance, the adjoining map seems to blur the limit separating the maritime and the terrestrial, for so many of the networks it depicts seem to flow effortlessly between the two realms. However, looking closer, one starts to comprehend how colossal the industrialisation is; how every single cross represents either a borehole, a gas platform or an oil platform, and every line illustrates a pipeline. The purple background represents noise disturbance mainly due to offshore activity, but also to shipping activity in some areas. It also reveals how colossal the decommissioning process will be, and how some structures could be repurposed for other projects – perhaps for the island...



- Boreholes
- + 1950 - 1980
- + 1980 - 1995
- + 1995 - 2010
- + 2010 - 2017
- + Oil platforms
- + Gas platforms
- Oil pipeline
- Gas pipelines
- Noise disturbance
- Urban areas
- Bathymetric contours
- Topographic contours
- Dogger Bank contour





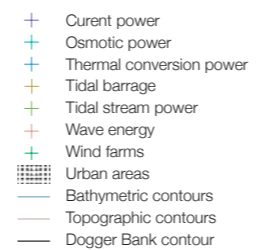
RENEWABLE ENERGIES

The rapid development of marine renewable energies in the North Sea, which has come to be known as the "Silicon Valley for offshore wind energy" [The North Sea Futures, 2017], is due to its adequately shallow waters and is especially visible in the German and British coastal areas. As mentioned previously, a report by the European Union Committee predicts a potential increase by fifty-fold of space allocated to wind farms and thereby increasing the pressure on other dynamic uses. The benefits of locating wind farms offshore, as opposed to onshore, are several: stronger and more predictable wind speeds, and an overall production efficiency 40% higher than on land. These wind farms are expected to be a major step towards the EU Renewable Energy Directive that requires 20% of the total energy needs to be covered by renewables by 2020, and 27% by 2030.

The map on the right pinpoints all of these renewable energy developments, and expresses, through the size of the crosses, the relative production in MW of each entity. As we can see, four major wind farms – totalling a massive 4.8 GW - have already been developed in the UK part of the Dogger Bank, and could be interconnected to the North Sea Energy hub when built. The island would significantly improve the accessibility to offshore wind farms, which is a key factor of their overall efficiency.

MAPPING CONCLUSION

The case study has shown how complex the seascape can be despite its uniformly calm appearance. It is definitely not a tabula rasa in the case of the North Sea, and as such, deserves to be properly considered in the development of artificial islands. The numerous, and often conflicting, dynamic uses of the North Sea need to be carefully mapped and compared to one another. This process will be developed further during my next semester, which will use the North Sea Island proposal as a starting point for an architectural project.



CONCLUSION

Learning from the use of islands throughout history, from the power of inspirational metaphors, from the previous constructions and purposes of artificial islands, and from the territorial analysis, Dogger Island could truly become a global inspiration for cooperation and sustainability.

It could act as a sort of social condenser on a territorial scale, bringing the surrounding countries together, similar to arctic research communities. It could become a centre for political cooperation, a neutral place. It would not serve an individual's economic benefit, but a benefit that crosses boundaries, as a power hub for Europe. Finally, it would be a beacon for scientific research in renewable energies and marine conservation.

On the metaphorical side, it might not be viewed as a sacred territory, but could definitely become as inspirational as island metaphors are, and be developed as a self-sufficient land reminiscent of the utopic societies described in literary fictions. It could be independent from the neighbouring countries, yet provide them with resources and knowledge.

In summary, Dogger Island could attain a new symbolic level that other projects did not reach in the past, as well as actually be the future of artificial islands.

REFERENCES

- Baldacchino, Godfrey. "Islands, Island Studies, Island Studies Journal." *Island Studies Journal* volume 1, no. 01 (2006): 4–6.
- Baldacchino, Godfrey. "The Lure of the Island: A Spatial Analysis of Power Relations." *Journal of Marine and Island Cultures* 1, no. 2 (December 1, 2012): 55–62. <https://doi.org/10.1016/j.imic.2012.11.003>.
- Banham, Reyner. *Los Angeles: The Architecture of Four Ecologies*. University of California Press, 2009.
- Bijsterveld, Aja, Derek Keene, Alexis Wilkin, John Naylor, and Arnoud-Jan Bijsterveld. *Town and Country in Medieval North Western Europe: Dynamic Interactions*. Isd, 2015.
- Bixler Heiser, Charles. *Of Plants and People*. 1992.
- Blass, Tom. *The Naked Shore: Of the North Sea*. Bloomsbury Publishing, 2016.
- Brenner, Neil, and Christian Schmid. "Planetary Urbanisation." In *Urban Constellations*, 2011.
- Byrne, Aisling. *Otherworlds: Fantasy and History in Medieval Literature*. Oxford University Press, 2016.
- Camp, D'Layne, and Jan De Graaf. *Europe: Coast Wise: Anthology of Reflections on Architecture and Tourism*. Rotterdam: 010 Uitgeverij, 1997.
- Castro-Santos, Laura, and Vicente Diaz-Casas, eds. *Floating Offshore Wind Farms*. 1st ed. 2016 edition. New York, NY: Springer, 2016.
- Contreras, Daniel. *The Archaeology of Human-Environment Interactions: Strategies for Investigating Anthropogenic Landscapes, Dynamic Environments, and Climate Change in the Human Past*. 1 edition. New York, NY: Routledge, 2016.
- Cooper-Richet, Diana, Carlota Vicens-Pujol, and Collectif. *De l'île réelle à l'île fantasmée : Voyages, littérature(s) et insularité*. Paris: Nouveau Monde Editions, 2011.
- Couling, Nancy. "Planning for Flow in Ocean Space: A Barents Sea Case Study," 2014.
- Deckers, Pieterjan, and Dries Tys. "Early Medieval Communities around the North Sea: A 'Maritime Culture'?", 2012.
- Djurđević, Muriz, and Paturet, Thomas. *An atlas of overexploited territories*. 2016
- "Ecological Quality Objectives for the Greater North Sea with Regard to Nutrients and Eutrophication Effects." OSPAR Commission, 2005.
- Elborough, Travis, and Alan Horsfield. *Atlas of Improbable Places: A Journey to the World's Most Unusual Corners*. Aurum Press, 2016.
- El-Reedy, Mohamed A. *Offshore Structures: Design, Construction and Maintenance*. 1 edition. Boston: Gulf Professional Publishing, 2012.
- Faria, Dominique. *Pensée de l'archipel et lieux de passage*. Éditions Pétra, 2016.
- Ghidoni, Matteo, ed. *San Rocco #01 Islands*, 2011.
- Goudie, Andrew S., and Heather A. Viles. *Geomorphology in the Anthropocene*. 1 edition. Cambridge, United Kingdom: Cambridge University Press, 2016.
- Gugger, Harry, Nancy Couling, and Aurélie Blanchard. *Barents Lessons: Teaching and Research in Architecture 2012*. Pap/Map edition. Zurich; Woodbridge: University of Chicago Press, 2014.
- Hoggart, Keith. *The City's Hinterland: Dynamism and Divergence in Europe's Peri-Urban Territories*. Routledge, 2016.

- Holand, Ivar, Ove T. Gudmestad, and Erik Jersin. *Design of Offshore Concrete Structures*. London ; New York: CRC Press, 2000.
- Ibelings, Hans, ed. *Artificial Landscape: Contemporary Architecture, Urbanism*. Rotterdam: Nai Uitgevers Pub, 2000.
- Jackson, Mark, and Veronica della Dora. *Spectacular Enclosures of Hope: Artificial Islands in the Gulf and the Present*, 2011.
- Jackson, Mark, and Veronica della Dora. "'Dreams so Big Only the Sea Can Hold Them': Man-Made Islands as Anxious Spaces, Cultural Icons, and Travelling Visions." *Environment and Planning A: Economy and Space* 41, no. 9 (September 1, 2009): 2086–2104. <https://doi.org/10.1068/a41237>.
- Koolhaas, Rem. *The Gulf*. 1 edition. Baden: Lars Müller: Lars Müller Publishers, 2006.
- Le Juez, Brigitte. *Shipwreck and Island Motifs in Literature and the Arts*. BRILL, 2015.
- Liszka, Thomas R., and Lorna E. M. Walker. *The North Sea World in the Middle Ages: Studies in the Cultural History of North-Western Europe*. Four Courts Press, 2001.
- Luo, Bin, and Adam Grydehoj. "Sacred Islands and Island Symbolism in Ancient China: An Exercise in Decolonial Island Studies." *Island Studies Journal*, no. 2017.
- Merelli, Annalisa. 2017. <https://qz.com/678164/in-the-mediterranean-paradise-of-lampedusa-rescuing-refugees-and-migrants-is-a-matter-of-common-sense>
- "North Sea RAC Fisherman's Information Mapping (NSFIMO Project)." North Sea Advisory Council, n.d.
- Pye, Michael. *The Edge of the World: How the North Sea Made Us Who We Are*. Penguin UK, 2014.
- "Report of the ICES Advisory Committee: North Sea." International Council for the Exploration of the Sea, 2008.
- Seguí Lineàs, Miguel. *De l'île réelle à l'île fantasmée : Voyages, littérature(s) et insularité*. Paris: Nouveau Monde Editions, 2011.
- Simpson, Tim. *Tourist Utopias: Offshore Islands, Enclave Spaces, and Mobile Imaginaries*. 2017
- Staniscia, Stefania. "The Island Paradigm and the Mediterranean." In *New Geographies, 5: The Mediterranean*. Cambridge, Mass: Harvard University Press, 2013.
- Szabó, József, Lóránt Dávid, and Denes Loczy. *Anthropogenic Geomorphology: A Guide to Man-Made Landforms*. 2010 edition. Dordrecht: Springer, 2010.
- "The North Sea Futures Manifest 2017: The North Sea Principles 'Life between Man-Made Ocean Structures.'" North Sea Futures, October 2017.
- "The North Sea under Pressure: Is Regional Marine Co-Operation the Answer?" European Union Committe, House of Lords, March 2015.
- Van de Noort, Robert. *North Sea Archaeologies: A Maritime Biography, 10,000 BC - AD 1500*. Oxford University Press, 2011. 44.
- Vine, Paula, ed. *United Arab Emirates Yearbook*. 2009.
- Walday, Mats, and Tone Kroglund. "Europe's Biodiversity." European Environment Agency, 2002. 7.
- Zwemmer, D. J. "Guidelines for Design and Construction of Artificial Islands," 1998. <http://resolver.tudelft.nl/uuid:8b9a1a0f-0b70-4a6c-bcef-cc478d0f7794>.

IMAGE SOURCES

- p.2-3. J. M. W. Turner. Venice from the Laguna. 1835. <http://www.tate.org.uk/art/artworks/turner-venice-from-the-laguna-tw0204>
- p.6. Apple. Ocean Satellite View. 2017. <https://5dwallpaper.com/nature-iphone-hd-wallpaper/ocean-satellite-view-preppy-original-free-hd-iphone-plus-wal/>
- p.11. More, Thomas. Island of Utopia. 1516. <https://techcrunch.com/2012/10/01/nyu-professor-open-sources-utopia-by-sir-thomas-more/>
- p.13. Yuan, Yao. Penglai, Depiction of One of the Mythical Islands. 1700s. [https://en.wikipedia.org/wiki/Yuan_Yao_\(painter\)#/media/File:Penglai_mythical_island.jpg](https://en.wikipedia.org/wiki/Yuan_Yao_(painter)#/media/File:Penglai_mythical_island.jpg)
- p.15. Pezzani, Lorenzo. A Pacific Solution. 2011. San Rocco, Islands.
- p. 16-17. Handley, Martin. Djupavik, Iceland. 2016.
- p.18-19. Unknown. Gunkanjima, Nagasaki Hashima. n.d. <http://www.street-pics.net/gunkanjima-nagasaki-hashima-2/>.
- p.20-21. United States Department of Defense. Mushroom-Shaped Cloud and Water Column from the Underwater Baker Nuclear Explosion of July 25, 1946. 1946. https://commons.wikimedia.org/wiki/File:Operation_Crossroads_Baker_Edit.jpg.
- p.24. DigitalGlobe, via the CSIS Asia Maritime Transparency Initiative, and CNES, via Airbus DS and IHS Jane's. Fiery Cross Reef. n.d. <https://www.nytimes.com/interactive/2015/07/30/world/asia/what-china-has-been-building-in-the-south-china-sea-cn.html>.
- p.33. Unknown. Maunsell Sea Forts. n.d. <http://www.forces.net/news/tri-service/ww2-forts-built-protect-uk-coast-will-be-recast-luxury-resort>.
- p.36-37. ConocoPhillips. The Ekofisk Complex in North Sea. 2014. <http://www.master-marine.no/wp-content/uploads/2014/06/?C=S;O=D>.
- p.39. Koolhaas, Rem. Coney Island Globe Tower. 1997. Delirious New York: A Retroactive Manifesto for Manhattan.
- p.40-41. NASA. Satellite Imagery Zuidoostzee. 2005. <https://commons.wikimedia.org/wiki/File:Zuidoostzee1.jpeg>.
- p.42-43. Unknown. Maunsell Sea Forts. n.d. <http://www.dekhnews.com/35-most-haunting-places-all-over-the-world/>.
- p.44-45. NASA. Dubai Satellite Imagery. 2009. <https://recortesdeorientemedio.com/mapas-de-los-emiratos-arabes-unidos/#jp-carousel-33686>.
- p.46. 2a+P/a. The Island of the Man with the Golden Gun. 2011. San Rocco, Islands.
- p.50-51. Espacio, Cero. A Church without God. 2016. <http://archeyes.com/church-without-god-espacio-cero/>.
- p.52. Jeff Schmaltz, MODIS Rapid Response Team, NASA/GSFC. Sediment in the North Sea. 2004. <https://visibleearth.nasa.gov/view.php?id=69721>.
- p.59. TenneT. North Sea Wind Power Hub. 2016. <https://www.tennet.eu/our-key-tasks/innovations/north-sea-infrastructure/>.
- p.60 Geological formation map. https://www.reddit.com/r/MapPorn/duplicates/7jduup/sea_level_map_showing_that_as_recently_as/
- p.74-75. Milligan, Andrew. The Transocean Winner Drilling Rig off the Coast of the Isle of Lewis after It Ran Aground in Severe Weather Conditions. 2017.

MAPPING SOURCES

- <https://www.gebco.net>
- <https://www.ospar.org>
- <https://www.eea.europa.eu/data-and-maps/>
- <http://www.marineregions.org>
- <http://www.oceanenergy-europe.eu/>
- <http://www.emec.org.uk/>
- <http://www.emodnet.eu>
- <http://www.emodnet-seabedhabitats.eu/download>
- <https://havbase.no>
- <https://www.thecrownstate.co.uk/energy-minerals-and-infrastructure/downloads/maps-and-gis-data/>
- <https://www.nationalgrid.com/uk/electricity/market-operations-and-data>
- <http://www.emsa.europa.eu/related-projects/tdms.html>
- <https://www.ogauthority.co.uk/data-centre/interactive-maps-and-tools/>
- <http://www.npd.no/en/Maps/>
- <https://data.gov.uk/dataset>

WEBSITES SOURCES

- <https://www.tourism-review.com/travel-tourism-magazine-flevoland-worlds-largest-artificial-island--article2372>
- <https://oilandgasuk.co.uk/key-facts/energy-provider.cfm>
- <https://business.un.org/en/entities/13>
- <http://www.australia.gov.au/about-australia/australian-story/convicts-and-the-british-colonies>
- http://ec.europa.eu/environment/nature/natura2000/index_en.htm

