SEASCAPES – THE PLANNING CHALLENGE OF THE CENTURY

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The sea - a material, spatial, ecological and recreational resource - is the site of one of this century's greatest planning challenges. Adopting the concept of *seascapes* as a parallel to landscapes, this paper traces the emergence of large-scale planned seascapes for both productive and protective purposes. While a relatively recent phenomenon, planning ocean space builds on centuries of *seascape construction* – a process merging natural, cultural, political and geological phenomena. Three types of seascapes are proposed following J. B. Jackson's landscapes one, two and three; the productive seascape, the essentially visual seascape and the all-encompassing, amorphous hybrid of architectural and natural systems. As a vital producer, the sea has become a site of spatial and environmental convergence- a condition within which economic value is threatened by overall ecological degradation. Marine Spatial Planning has therefore been initiated as a way of regulating interactions and conflicting spatial claims. The resulting plans are static and highly rational, divided into sectorial areas of economic priority. However a close-up study of the Nysted offshore windpark –a large-scale planned seascape– reveals surprising interdependencies; energy production infrastructure and sea-life must share both time and space. Can a deeper understanding of seascape types and properties steer their very planning towards shared, integrated, and open-ended spheres of activity?

INTRODUCTION

In western civilization, man's interaction with the sea is accompanied by his instruments of measure and control, both of which are a prerequisite to planning. *Spatialising* – that is producing a particular space – is a social act.[1] We are intrinsically spatial beings, continuously engaged in the collective activity of providing spaces and places.[2] Formalization of these spaces into legislative units is a political act carried out either through negotiation or the execution of power. The history of the formalization of ocean space is therefore as long as the history of negotiation and political power itself.

Alliances and rivalries between influential individuals or political units at sea were fluid and dynamic, similar to the situation on land before the rise of the nation state. However, the first fundamental territorial concepts of an international dimension were initially discussed and ratified in relation to the ocean.[3] These concepts have subsequently laid the foundations for the establishment of *large-scale planned seascapes* and the emergence of a radical new urban realm within the unfolding history of planning.

TREATY OF TORDESILLAS

The 15th century Spanish and Portugese expeditions, in particular Christopher Columbus's successful first voyage from Palos de la Frontiera to the Bahamas in 1492, sharpened the rivalry between Spain and Portugal and fuelled an urgent debate on the reign over ocean space and newly discovered territories. In 1493 Pope Alexander VI issued the famous bull resulting in the 1494 Treaty of Tordesillas, which divided the Atlantic by a line fixed at 1000 leagues west of the Azores & Cape Verde islands. Lands to the west of the line were to be governed and possessed by Spain, lands to the East by Portugal. Although the hypothetical line itself was not enforced and other states possessed a greater maritime strength and therefore contested its authority, it nevertheless represents a watershed in international relations and the concept of demarcation of ocean space on a grand scale.

POLITICAL TECHNOLOGY

In his investigations of the conceptual basis for understanding territory, Stuart Elden argues that territory has come to mean a politically contested and controlled space, depending on techniques of land surveying and cartography, hence defined as *political technology.*[4] According to Elden, the 15th – 16th century concept of bounded space as a product of geometry existed before the instruments implemented to define it. He argues that this way of grasping space still persists as the *"overriding geographical determination of our world".*[5]

The calculation and representation of ocean space have presented a formidable challenge for Western systems of navigation and cartography. Columbus's expedition owes its success less to his navigational skills than to his understanding of the Atlantic trade winds, which practically carried him across the Atlantic in a southeast direction and back up along the path of the westerly winds through the northern Atlantic and eastwards back towards Lisbon. The competition to accurately calculate longitude, which resulted in the prize being awarded to the English watchmaker John Harrison in 1774, (38 years after his first instrument H1 made its trial voyage) is a further example of this lapse between technology and the spatial practice of the time.[6]

However, despite the highly competitive nature of maritime exploration between 15th and the 17th centuries, the ocean itself was not of political interest as a place to possess or develop. Although merchant capitalism reigned and sea power was understood as the means to political and economic power, the role of ocean space in these activities is described by political geographer Philip Steinberg as a force-field:

"The sea was the surface across which transpired much of the channelled circulation that characterised merchant capitalism. It was a space in which state-actors exerted power and sought a degree of control… a special space within world society, but outside the territorial states that comprised its paradigmatic spatial structure."[7]

MARE LIBERUM

In 1609, Dutch jurist and philosopher Hugo Grotius published his influential book *Mare Liberum*. This was a response to international discussions on the rights of passage at sea, in particular the Pope's bull, since the Dutch East India Company also had vested trading interests in the Indian and Pacific Oceans. *Mare Liberum* argued for the freedom of the seas in the general interests of mankind, for innocent use and mutual benefit of the seas for all- a concept understood to be also of economic benefit for all.

It was however implicitly understood that nations should have jurisdiction over the territorial seas close to their shores and that other maritime nations could expect a certain amount of protection from pirates and other attacks within this zone. In the early 1700s it was also the Dutch who formalized this idea by issuing a decree to establish a three nautical mile-wide "territorial sea" - the hypothetical range of an imaginary cannon. The military defence of this zone was thereby implied and was accepted amongst maritime powers as a prerequisite for profitable trade.

UNCLOS

The processes of exploration, discovery and allocation of "territory" described above, construct a layer of legislative *seascape*, enveloping the sea within systems of order while ensuring that ocean "roadways" remain fluid and open. A blurred border between a calculable, tangible, manipulated territorial sea and the uncontrolled, contingent "high seas" is established. A border, however, that with the full realization of the value of subsea resources, is to become increasingly sharpened.

The 1982 United Nations Convention on the Law of the Sea (UNCLOS) - the single-most influential document regarding ocean space since the Papal Bull– marked the culmination of fifteen years of preparatory studies.[8] The Convention is a direct result of accelerating spatial conflicts at sea and a testimony to advancing urbanization processes, in particular since the end of World War II. The main features of the Convention were the definition of the Territorial Waters to 12 nautical miles (nm) offshore, and of Exclusive Economic Zones (EEZ) to 200 nm offshore, with the possibility of further EEZ extension under particular geological circumstances. Within this zone, coastal nations enjoy the right to resource exploitation and the responsibility for conservation (Figure 1). Beyond the EEZ, international waters thus become reduced to around 64% of ocean space (Figure 2).
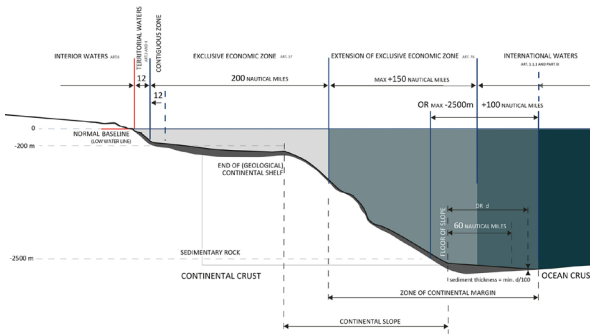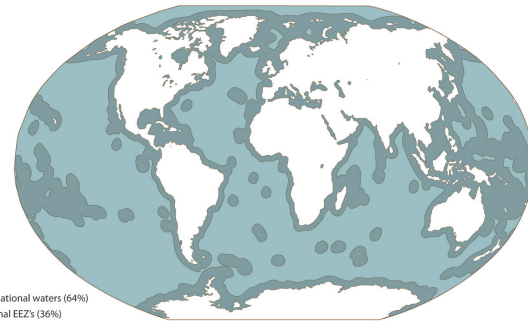
FIGURE 1 Ocean Zones defined by UNCLOS 1982

FIGURE 2 Global distribution of International Waters and Exclusive Economic Zones

THE UNTAMED SEA

Hence the large-scale planning of ocean space emerges under the combined influence of cultural and political conditions. However, due to the inherent nature of the ocean itself, tension reigns between control and the natural "laws" of the sea; the ocean and its mobile bounty roll through all legislative boundaries distributing both organic and inorganic contents en route. Changing temperatures transform and destabilize the oceans, which according to John Urry are "*exacting their revenge*".[9]

Parallel to the formal spatialisation described above, other mechanisms interact with the ocean in unofficial, discreet and subtler ways. Ocean space is wide and deep and has the potential to harbour a range of activities and practices in a way that would be impossible on land. Outer EEZ limits come under surveillance only in the most extreme cases and borders are highly abstract. This means spatial practice effectively follows a logic rooted in centuries of ocean travel, exploration and exploitation, shipping, deep-sea fishing and warfare. Hence the high seas represent the largest periphery on earth. Far from being home to only pirates and renegades, many activities taking place here are firmly within the grip of multi-national corporations and unofficial political alliances. Keller Easterling vividly describes this zone as "slushy" waters[10] and with the term term "Offshoring", John Urry exposes the wide-spread, secretive practices which dominate the global economy.[11]

SEASCAPES

The Sea's fundamental "landscape" characteristics hold the key to the economic potential of the fishery, wind, tourism, aquaculture and research sectors. Land- and seascape are topographical, have physical properties and are geographically rooted. I argue that seascapes are also "cultivated", and manipulated over time, although at sea such modification has remained largely indecipherable.

The origins and meanings of Landscape have been well researched and documented, providing a rich terrain from which to approach *seascapes*. Theorists discuss three accepted and distinct understandings of the term landscape; the productive landscape, the essentially visual landscape and the all-encompassing, amorphous hybrid of architectural and natural systems. In all three of the above, landscape exists by definition only in relation to urbanization. J.B. Jackson called these landscapes one, two and three.[12]

SEASCAPE ONE

Landscape one is a productive unit of organisation.

According to its origin in Old German, *Landschaft* referred to a group of inhabitants intrinsically connected to a certain area through patterns of activity, occupation and space, including agricultural fields surrounding a cluster of houses, and people walking out to the fields on a daily basis. It also implied the inhabitants' obligation to the land and to one another.[13] Landschaft represented the dominant form of domestic organisation in the medieval period and can still be found in some traditional communities today. Olwig uses the example of the *landschaften* of Dithmarshen located on Germany's north-western coast to illustrate the integral political essence of landscape:

*"Landschaft as place was thus defined not physically, but socially, as the place of a polity. The physical manifestation of that place was a reflection of the common laws that defined the polity as a political landscape".*14

Until 1864, Dithmarshen managed to maintain its "landschaften" as a means of community organization alternative to the advancing centralized, urban modes of control in the adjacent regions of Schleswig-Holstein.

This landschaft relationship displays what Stilgoe calls a *fragile equilibrium between natural and human force*; terrain and vegetation are moulded, not dominated.[15] When this balance tips towards structure and built form, it becomes a related, but distinct variety of scape- the *city*scape.

I argue that traditional fishing practices also moulded their environment through a daily relationship with the physical environment and the organisation of a social group and therefore contributed to *scaping* the sea in the sense of landscape one. Mediation of the seascape through vessels, ports, fish-processing facilities, piers, buoys, nets, lines and cages, is ephemeral in relation to the scale of fishing grounds themselves. However, while traditional fishing practice produced seascape through habitual interaction rather than through visually marking the territory, the fishing industry has since become highly regulated and industrialized. Trawler vessels now scrape the ocean floor, modifying its profile and damaging adjacent habitats.

In order to achieve effective and sustainable fisheries management in the Barents Sea, all fishing activities are controlled through the monitoring of fishing vessels, quotas, licenses and restricted zones. Vessels over 15 m in length operating in Norwegian waters are required to carry a tracking device that automatically submits data to the fishing authorities. The electronic monitoring system records location and catch in each of the Norwegian, Russian and special Svalbard fishing zones. These invisible systems then become recognisable as a particular type of large-scale, planned, productive seascapes only through the translation of data into maps (Figure 3). In this example of the Barents Sea fisheries, which are signatories to the NEAFC[16] Convention, the relationship between seascape one and the fishing community is mediated through sophisticated technology.

The scale and maritime reach of these communities is large, as demonstrated in figure 3., yet due to the shared environment and vested interest in keeping fish stocks balanced, the Norwegian and Russian fishing communities boast a long and largely successful collaboration.[17] This type of planning, although adhering to large, bounded zones, is also regulated according to dynamic ocean conditions; areas may be closed and catches reduced. Seascape one is not a static entity.
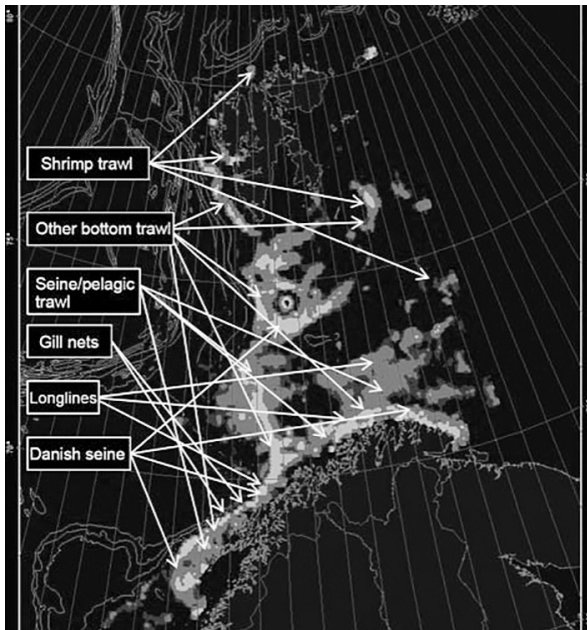
FIGURE 3   Fishing activity in the Barents Sea, 2011 Figure 4. Gerhard Richter, Meerlandschaften, Atlas 1970

FIGURE 4 Gerhard Richter, Meerlandschaften, Atlas 1970

SEASCAPE TWO

Landscape is believed to have entered the English language as *landskip* at the end of the 16thC, imported from the Dutch *landshap* meaning at first only Dutch landscape paintings. The meaning quickly developed to intend large-scale, aesthetically pleasing rural vistas and was the beginning of the inextricable association of landscape with image.

This period corresponded with the beginning of technological innovation and urbanization, and most of the great 16th & 17th century painters travelled and observed the landscape - that is the space shaped for agriculture- with an aesthetic interest in its picturesque and compositional qualities.

The common usage of the word seascape corresponds closely to the concept of landscape as a pictorial view. Capturing the sea through paintings followed the genre of landscape painting, although at a later date. The rising

importance of maritime trade and naval power in the 16th century, in particular in the Dutch Republic, provided new artistic subject material. The sea then also became a subject in its own right through the interest in ocean voyages and navigation. During the 18th century, seascapes revealed the fascination with ocean creatures and the ocean as a chaotic, mysterious wilderness that resisted taming by the forces of modernity.[18] [19]

The seascape image, however, differs from the landscape image in that the artistic "view" of the sea is not related to a possible ordered, scaped quality. Instead, the abstract, minimalistic potential of a seascape – a "view of the sea" – has attracted the imagination of several contemporary artists. The representation of the two essential elements – water and air – mean that seascapes can be both "nothing" and "everything" simultaneously (Figure 4). This was precisely the intention of Gerhard Richter in his "Meerlandschaften"- to avoid an *"overly personal interpretation of the subject"*.[20] Seascape two engages with the enigmatic horizon; ever-expanding as we move towards it yet demarcating the ultimate limit.. *a shifting line where perception trails off.21*

Nancy Couling
SEASCAPES – THE PLANNING CHALLENGE OF THE CENTURY
A CASE STUDY OF NANBU REGION IN TOHOKU

The Planning of ocean space must also engage with this phenomenon, respecting dedicated "open" areas and protecting an unencumbered horizon. The Spatial Plans of the German Exclusive Economic Zones, although strongly steered by economic priorities, also state this objective; *spatial planning also safeguards open spaces in the sense of largely unspoiled and undisturbed habitats and landscapes as a prerequisite for ecological regulation as well as for "landscape experience" and for basic research.*22

SEASCAPE THREE

Landscape three is everywhere.

Jackson observed that what he saw in the contemporary American landscape matched neither of his own definitions of landscapes one or two. He defined landscape three as:

*"a system of man-made spaces on the surface of the earth… it is never simply a natural space, a feature of the natural environment; it is always artificial, always synthetic, always subject to sudden or unpredictable change. We create them and need them because every landscape is the place where we establish our own human organization of space and time…A landscape is where we speed up or retard or divert the cosmic program and impose our own"*23

In *Great Leap Forward*, Koolhaas and team call the diffuse, amorphous urban conglomerations rapidly transforming the Pearl River Delta simply SCAPES; *the arena for a terminal confrontation between architecture and landscape.*24

In oceanic zones of intense activity, seascape three can be readily recognized. In the example of the Baltic Sea, areas of human organization have been visibly imposed and programmes of seascape protection spatially compete with zones of production; traffic separation schemes have been installed in order to control heavy marine traffic, to protect vulnerable environmental sites and to optimize the highly frequented ferry routes.[25] The ocean floor is the location of energy and communication infrastructure as well as mines and dumped military waste. As part of the EU directive, *Natura* 2000 areas of ecological importance have been defined, however their protection remains to be reinforced by national legislation.

Seascape three is both the cause and result of planning processes. The acknowledged need to actively plan this space testifies to the densification of both traditional activities such as fishing, shipping, military activities and dredging and new energy-related activities gaining in critical economic importance. Planning is beginning to give visual form to the way we "scape" ocean space.

OCEAN PLANNING

The European Environment Agency has identified the Baltic Sea, the North Sea and the Mediterranean as the important European locations for concentrated off shore wind-energy potential.[26] Faced with ambitious renewable energy targets, offshore wind represents a plausible solution for many northern European countries, with Denmark and Germany in the foremost positions. Denmark is well on target for their goal of 50% electricity production through wind power by 2025, already breaking world records in 2015 by producing 42% of its energy through wind.[27] Germany's feed-in tariffs for wind power, introduced in 1990, were responsible for a surge of investment interest, which ultimately moved offshore and triggered a flood of applications for offshore wind-power installations.[28] Preliminary work began in 2002 and in 2009 Marine Spatial Plans for the German Exclusive Economic Zones in the North Sea and Baltic Sea were released largely in response to these demands.[29]
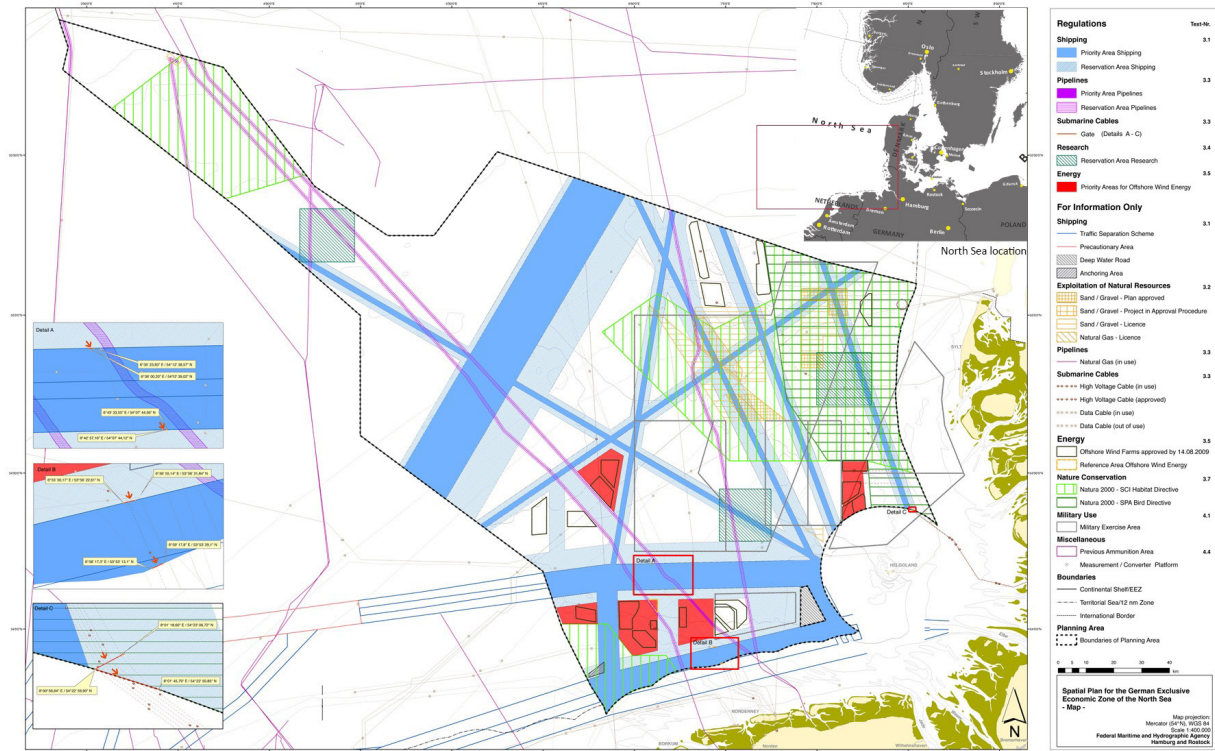
FIGURE 5   Marine Spatial Plan for the German Exclusive Economic Zone of the North Sea

FIGURE 6 Location, Nysted Windpark, Baltic Sea

The German spatial plans are regulatory documents clearly defining maritime transport and wind-power priority areas (Figure 5). Nature conservation areas under the EU Natura 2000 Habitat and Bird Directives are indicated for information only, since responsibility for applying legislation to these areas lies with the state, however protection does not mean full exclusion of human activities and individual management plans are required for each area.

The Marine Spatial Plan for the North and Baltic Seas are therefore an example of planned seascapes on a vast scale. Originally a UNESCO-supported initiative aimed at *"finding space for biodiversity conservation and sustainable economic development in marine areas"*[30] marine spatial planning has developed with a strong economic bias into an EU directive which requires all European coastal nations to develop marine spatial plans by 2021.[31]

NYSTED WINDPRK

Wind-energy production in the Baltic Sea is also creating new seascapes through the command of large offshore areas which double as important habitats for other species, in particular for wintering birds or spawning fish. Hence interrelations between ecology, seascape and technology are a characteristic of Baltic sea-space. Windparks are also referred to as *wind farms*. The Danish Energy Agency call wind-power production *"harvesting the wind"*.[32] Unlike traditional fishing practices, this type of harvesting has a marked effect on the physical and visual environment.

Nysted windpark was chosen by the Danish government in 1995 as a test site for one of five demonstration wind energy projects aiming to expand power supply with offshore installations. Covering an area of 28 km² at an offshore distance of 10km from Lolland in the Belt Sea, Nysted consists of 72 turbines arranged in 9 rows of 8, each with a capacity of 2.3 MW (Figure 6). Energy production began in December 2003.

The selection of the Nysted location was due to local wind-speeds, the shallow water-depths of 6,5 – 9 m and the proximity of the high-voltage grid connection at Radsted switching station 18 km away. The ice-free port of Gedser provides the operational service base. Just 8 km south of the park, the T-route shipping lane connects the Baltic Sea to the North Sea with a volume of 48,000 ships/year.[33] A second windpark with 90 turbines, Rødsand II, was constructed upwind 5 years after the completion of Nysted.

The Rødsand lagoon directly north of the windpark, is on the other hand, an important breeding, resting and feeding ground for birds as well as the site of a seal sanctuary located 3 km away from the closest turbine. Within these restricted conditions, the local situation at Nysted reveals a high level of interdependence and spatial interpenetration of natural and cultural systems (Figure 7).

Adaptation of maritime life-forms to the windpark has both positive and negative features; the solid foundations and large protective stones provide a new hard-bottom substrate which can improve biodiversity and attract fish species. At Nysted, however, the main population to colonise the substrate was the large common mussel, which is only *"moderately attractive for creating a diverse fish habitat."*[34] While fishing is permitted within the windpark area, trawling is prohibited due to the risk of cable damage, therefore fish populations are indirectly protected after the initial construction phase. The environmental impact report for Nysted concluded that migrating birds *"show a natural response to the windfarm, specifically reacting by increasing lateral avoidance to the north and south of the windfarm"*[35] Although bird migration paths were only marginally considered in the development of this windfarm, other studies have been more progressive in engaging bird-watchers to assist in windpark planning. Nadaï and Labussière discuss such methods in the South of France; *"We approach landscape through the logic of affect, that is to say, by following the way in which birds might come **to share the wind** with wind power (and vice versa) and the way in which emerging wind power landscapes and planning might succeed (or not succeed) in recomposing the relations between these parties."*[36]
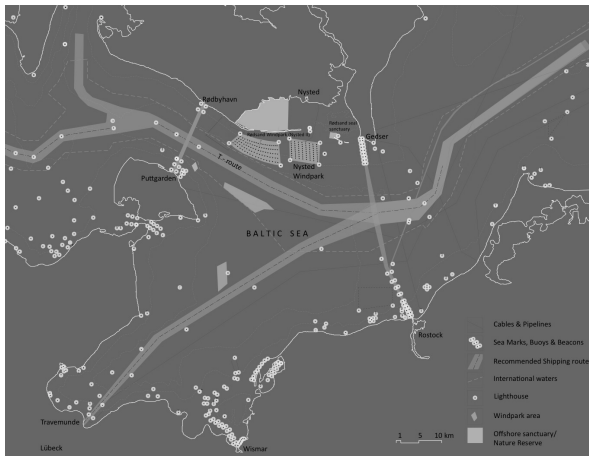
FIGURE 7 Territorial context, Nysted Windpark.

FIGURE 8 Local turbine distribution land and sea.

FIGURE 9 Open pathways through the windpark

Through a consultation process with the developers, the local Nysted community requested the windpark
be named after their town and together the exact orientation of the 72 turbines was determined in order to
minimalize the volumetric visual impact of the park. An almost north-south orientation of the eight rows of nine
turbines was agreed. On land, Denmark has a strong tradition of decentralized wind-energy production under
local ownership, contributing to a high degree of "social interpenetration" and acceptance. This pattern is evident
in the ca. 100 turbines located on land in the local Nysted area in Figure 8.

Differing levels of openness and closure allow different kinds of penetration through the park- regulatory boundaries are open and regular crossings of the space take place through individual sailing routes, tourist and research visits and daily maintenance (Figure 9). Turbines are placed at distances of 478m in the cross-wind and 865m in the downwind direction, therefore the uninhibited flow of marine life and water-masses is enabled.

CONCLUSION

In contrast to the surface view of spatial planning, the close-up examination of relationships at Nysted reveals a series of interwoven pathways and nature/culture interdependencies, enabled by the porous, distended arrangement of the park itself. This energy seascape contains numerous levels; the "*smooth space*"[37] of the ocean surface is fitted with turbine shafts but their wide dispersal maintains the passage of fluid movement, energy is generated in an upper zone shared with birds and sub-sea foundations offer potential habitats for a range of new species.
The role of planning in the establishment of this seascape, has however still remained rudimentary. Within a sea-space urbanized through infrastructure, energy production and intensive shipping, the planning of large-scale seascapes faces the challenge of allowing for participation of both human and oceanic life-forms. Learning from Nysted, and at the same time reflecting on the history of ocean spatial demarcation, I argue that forms of spatial order should be more in line with the principle of *Mare Liberum*- that is, open-ended, interpenetrating layers of plural use rather than sectorial zones fixed in space and time. Such an approach calls for flexible design tools and oscillating boundaries. Seascapes one, two and three discussed here must all be accommodated and integrated into planning strategies- research shows that almost no part of the global ocean remains free from human impact.[38]

Large-scale planned seascapes mark a paradigm shift in maritime interactions and the emergence of a new urban realm beyond the picturesque. Sustainable co-habitation of this realm calls for the democratic coordination of a deep, kinetic, contingent and highly differentiated spatial commons, engaging the active involvement of its global stewards.

Disclosure Statement
No potential conflict of interest was reported by the author.

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Endnotes
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1 Lefebvre, *The Production of Space.*
2 Edward W. Soja, *Postmetropolis.*
3 Theutenberg, 'Mare Clausum et Mare Liberum'.
4 Elden, 'Land, Terrain, Territory'.
5 Elden, 'Missing the Point'.16
6 Sobel, *Longitude.*
7 Steinberg, *The Social Construction of the Ocean.*105
8 UN, 'UNCLOS 1982'.
9 Urry, *Offshoring* p.166
10 Easterling, *Enduring Innocence.* 70
11 Urry, *Offshoring*
12 John Brinckerhoff Jackson, *Discovering the Vernacular Landscape*
13 Stilgoe, *Common Landscape of America, 1580 to 1845*
14 Kenneth R. Olwig, *Landscape, Nature, and the Body Politic.*10
15 Stilgoe, *Common Landscape of America, 1580 to 1845.* 3
16 North East Atlantic Fisheries Conmmission
17 Hønneland, *Making Fishery Agreements Work.*
18 Stilgoe, *Common Landscape of America, 1580 to 1845.*
19 Steinberg, *The Social Construction of the Ocean.*
20 Buchloh, *Photography and Painting in the Work of Gerhard Richter.* 135
21 Maleuvre, *The horizon* p xiii
22 German Federal Agency for Nature Conservation (BfN), *Spatial Planning in the German Exclusive Economic Zone of the North and the Baltic Seas- Nature Conservation Objectives and Principles* .10
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24 Chung et al., *Great Leap Forward* . 393
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Nancy Couling

SEASCAPES – THE PLANNING CHALLENGE OF THE CENTURY
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