

Issue #03 Delta Challenges under Nature-Based Solutions Perspectives

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*Between The Sea
And Giants:*

*The Case on Nature-
Based Solutions along
the Flemish Coast*

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The Belgian coastline is 65 kilometres, has 15 coastal towns and, like many of its North-Sea neighbours, experiences the volatile dynamics of sea level rise and raised demand for effective coastal safety measures. Today, we are seeing the consequences of hard and grey infrastructural solutions which solely address the concerns of coastal safety in a majority technical way. Along the Belgian coast, exists an array of sea walls, dikes, and beaches along a traditional sweeping concrete surface delineating the edge between land and sea. Through the perspective of Nature Based Solutions (NBS) this paper will unpack how NBS has been planned and implemented across three of the Belgian coastal towns Bankenberge, Middelkerke and Ostend. These three Flemish pilots are representative for the typical coastal conditions of a dense urban frontage along concrete boulevards, substantiating the edge condition to the sand and sea. The pilots are a showcase of how NBS can acts as a performative buffer, or interface, between the urban edge and the sea, between the sea and giants.



Placement of Eco-blocks along the breakwater at the Newlyn project site. Source: SARCC Project, 2022

INTRODUCTION

The Sustainable and Resilient Coastal Cities (SARCC) project, one of the projects within the 2 Seas program of INTERREG, is focused on streamlining NBS solutions through seven pilots across four countries, The United Kingdom, The Netherlands, Belgium, and France. The core of the project is the idea of working with nature, rather than against it through balancing the benefits of socio-ecological systems (Sowińska-Świerkosz, 2022). The type of NBS however differs per case while they all address societal challenges, restore ecosystems or help mitigate risks of climate change. It is also essential that innovative solutions respond to the conditions of the context and its Longue Durée.

The innovative nature of NBS leads to reluctance to implement because it is not yet proven in its performance and the financial and managerial costs are not clear (European Commission, 2022). However, research suggests that NBS are cost-effective with awareness of the different financial models that may require a larger upfront investment for long-term impact (Van der Biest, K et al, 2017). Programs such as the INTERREG program, a research and impact funding scheme under the European Commission, develop topic-focused programs such as the 2 Seas Program that aims to create more experience and evidence, and mainstream Nature-Based Solutions

into coastal management and policy-making across coast cities within the INTERREG ecosystem.

The Belgian coastline is 65 kilometres, has 15 coastal towns and, like many of its North-Sea neighbours, experiences the volatile dynamics of sea level rise and raised the demand for effective coastal safety measures. Today, we are seeing the consequences of hard and grey infrastructural solutions which solely address the concerns of coastal safety in a majority technical way. Along the Belgian coast, exists an array of sea walls, dikes, and beaches along a traditional sweeping concrete surface delineating the edge between land and sea. The 15 medium size towns are scattered along the coast, where this threshold is substantiated by paved and impermeable surfaces connecting the dominant urban face, giving little space for socio-ecological dynamics, such as water infiltration, recreation, vegetation and biodiversity. In contrast, increasing demands for Nature-Based Solutions can be seen as an opportunity to transform these hard edges into a dynamic interface and strengthen coastal resilience in an integrative manner.

Through the perspective of NBS, this paper will unpack how NBS has been planned and implemented across three of the Belgian cases. The three pilots are unique



Transformation of road segment into grassy- dune
scape and foot/cycle path at Blankenberge project site.
Source: SARCC Project, 2022

in their coastal condition, particularly with dense urban frontage along concrete boulevards, substantiating the edge condition to the sand and sea. The space between the urban edge and sea, the interface, is the predominant domain of intervention across all three Flemish pilots. In doing so, the review of these cases will be developed through the lens of the interface and unravel how NBS acts as a performative buffer between the urban edge and the sea, between the sea and giants.

THE INTERFACE ALONG THE FLEMISH COAST

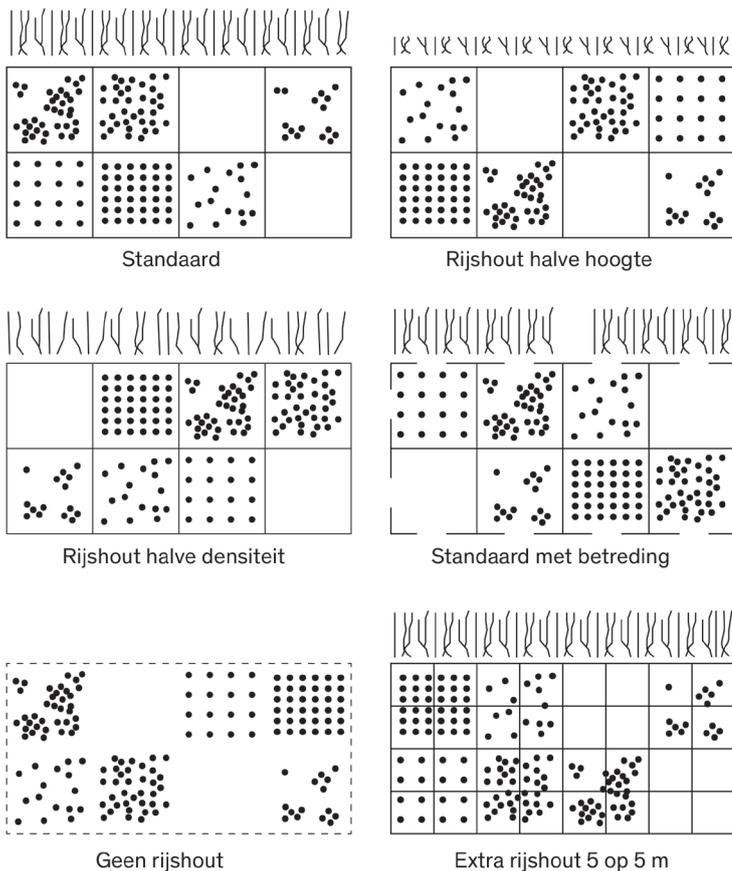
Blankenberge

The project of Blankenberge sits along the main road connection behind the dune stretching east and west, connecting itself to the N34, an arterial road spanning almost the entire country's coastline. The coast of Blankenberge is lined with a one-kilometre-long dune connecting the city's boulevard and the city's seawall. The location of the pilot is adjacent to the main road and behind the kilometre-long dune. The road is comparatively larger than the other roads in the city, which facilitates a two-direction tram line and road and is flanked by parallel parking. The main objective of this pilot is concerned with returning close to 50% of its section (approx. 12 meters) back to

nature, specifically to expand the current system and facilitate human-based mobility such as a new foot and bicycle path. This effort also reflects an increasing demand to 'bring back' nature over the last decade (Hooimeijer and Bortolotti, 2022). In principle, the aims are to double the dune and prioritize native and endangered species by transitioning the largely concrete road surface to a natural corridor. By naturalizing the space between the coast and the first line of urban frontage, an interface is realized, enabling socio-ecological benefits such as ecosystem enrichment, and activation of human-centred mobility while strengthening the coastal resilience capacity.

Ostend

Together with the Municipality of Ostend as well as the Maritime and Coastal Agency, the project in Ostend focuses on how the sea wall, in the context of high flood risk and consequential impact, can be combined with the nourishment of the beach (Hooimeijer and Bortolotti, 2022). The pilot project is concerned with the capacity between the beach and the urban edge. Given the large span of open-air sand, the beach and consequentially the larger urban coastal conditions face challenges of erosion and the uplift of sand during high winds. To address this intersection of challenges and diversify the current plans for extending the sea wall, the project aims



Planting scheme on dune at the project site in Ostend.
Source: SARCC Project, 2022

to embellish the current seawall along the tram line with a dune. The design of the dune includes the planting of local vegetation to tame the sand in windy conditions (see Figure 3). Additionally, the design creates recreational and leisure functions to increase the attractiveness of the area. In doing so, a bike lane is combined along the dune and on top of the dike. The catching of the sand by the dune with its planting allows the cycle path to stay free of sand and be used without obstruction.

Introducing a combination of recreation, and leisure through an ecological landscape such as a dune along the existing hard infrastructural solution enables conditions for an active interface that is multi-functional as well as non-intrusive. Although the intervention can be deemed 'minimal' in the grand scheme of NBS around Europe, it has been slowly adopted by the community and is increasingly considered a vital armature of socio-ecological benefits. The naturalization of the hard edge between urban and coastal conditions serves as a viable solution for a cost-effective, high-impact, easily acceptable interface for the local community and ecosystem to thrive (Gussé, Stijn., et al., 2022).

Middelkerke

Similar to the partnership between Municipality and Agency for Maritime and Coastal Services, the Middelkerke project aims to reinforce the existing seawall through the realization of an 85-hectare vegetated dune activating the adjacent residential fabric. The proclaimed, dune for a dike project, contains three aspects to the design, increased protection, green and sun, making for a multi-functional operation (Gussé, Stijn., et al., 2022).

Currently, the pilots serve to provide the dune as a cost-effective solution and after several months of being active, it has proven to positively compensate for the upfront maintenance and 'setting-up' process, by lessening the maintenance required over long-term operation. During a workshop on sharing progress, pilot managers from Middelkerke stated that the activation has enabled cascading socio-economic benefits such as increasing financial investment incentives for businesses and increased access to recreational activities for both local inhabitants and incoming tourists (Ibid).

After its implementation, this project can be seen as an effective pathway to implement NBS due to the project being bound by European Union law. As a project within the INTERREG program, the project can secure its realization by leapfrogging any stalling local bureaucracy and accelerating the decision-making process under the umbrella of an EU-funded project. Considering its suc-



Planting of Marram grass and construction phases at the Middelkerke project site.
Source: SARCC Project, 2022

cess, the interface, in this case, was able to materialize a range of benefits that positively impacts the well-being of both the local biodiversity as well as inhabitants, while in turn proving the positive return on investment through cost-effective maintenance and local business development (Ibid).

CONCLUSION

The interface as a Nature Based Solution

Across the three project cases, NBS serves as a simple and effective solution that can act as a productive interface enabling socio-ecological transformation, being a natural buffer to neutralize the threats of sea level rise, and erosion of the shoreline, and mitigating the uplift of large uncovered sandy areas. The implementation of dunes, which in this case is the primary medium, also establish and regenerates biodiversity, creating local flora and fauna for them to thrive. Moreover, undeniable benefits that arise can be attributed to recreational and coastal safety maintenance. This demonstrates the vegetated-dune landscape proves to have widespread values engaging with the surrounding social fabric, activating socio-economic activities such as local economies as well as providing a space for recreation. Giving the space back to nature through a human-centred experience. From concrete to sand, from weeds to tall grass and insects, from

grey to green, and from degenerative to regenerative. The three Belgian cases exemplify the cost-effectiveness, high impact and versatility of simple implementation of NBS like the vegetated dunes.

It also showcases the various typologies of this landscape, from the double-dune, dune as a dike, and coupling with hard infrastructure such as a sea wall. Between the distinct urban frontage and the sea, these interventions have created a productive interface, far exceeding the values of pre-existing conditions, by introducing a naturalized buffer area serving as a value multiplier across societal, economic, operational and ecological domains.

The sea-land relationship along the Belgian coast is not unique, however, the dense urban fronts are very typical and for example, are rarely found in the Netherlands. An ideal comparison would be with Scheveningen where the solution for boulevard enforcement has been done with grey infrastructure. Thus, the implementation of these NBS interfaces can be considered a best practice or exemplar case as a real cost-benefit alternative to traditional mono-functional hard-grey infrastructures. The collective effort along the North Sea coastline, could inspire larger initiatives around the world and unite coastal resilience through a nature-based approach.

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