

COASTAL CONQUEST

ROEL BEKKERS | TIM BOLLEBOOM | NAFTHALY DE GRAAF | ROBBERT LANCEL | JOOST VAN DER ZANDEN

GRADUATION STUDIO 2015-2015
MA+U TILBURG

25-10-215

COASTALCONQUEST

After a period of over 1000 years of artificial preservation of the coast line it is time to let nature shape the land again. "Alterations of land and sea are indissolubly connected to the Wadden islands. The wind and the sea make of the islands a very dynamic area in which composition and decomposition constantly alternate in a natural way." [Eilanden Natuurlijk, Löffler, 2008]

HYPOTHESIS

Ameland as a test bed for large scale dynamic coastal management leads to a highly differentiated natural landscape with vast economic potential for recreation.

Artificial preservation of the Dutch coastline, has led to a one-dimensional static landscape and inherent coastal tourism. Ameland is no exception. Continuance and expansion of dynamic coastal management will introduce a new layering of the landscape where man and nature reconnect. These landscapes create opportunities for new development and add value along the coast of Ameland, among natural and urban systems.

Where the historical buildings are important signatures as well as highly valued objects, architecture should fulfill a pioneering role in exploiting the symbiotic potentials the new landscape has to offer.









*“Woest staan de golven op mijn levensschip
Wakend, de vuurtoren is een veilige stip”*





“Oud hout op de zolder”

CONTENT

DYNAMIC COAST MANAGEMENT	12
SOIL & SUBSOIL	18
CLIMATE AND WEATHER	20
A BRIEF HISTORY	22
MORPHOLOGY	26
ECONOMICS	28
THREATENED BY THE SEA	30
TOURISTS TO THE RESCUE	32
VALUEMAP TOURISM	38
VALUEMAP LOCALS	44
VALUEMAP COASTLINE	46
PROTECTING AMELAND	48
SCENARIOS	50
CONCLUSION	66
PROJECT LOCATIONS	68
SOURCES	70
APPENDIX 1 - SEA MAP	74
APPENDIX 2 - REAL ESTATE AMELAND	76
APPENDIX 3 - LIST OF STAKEHOLDERS	78

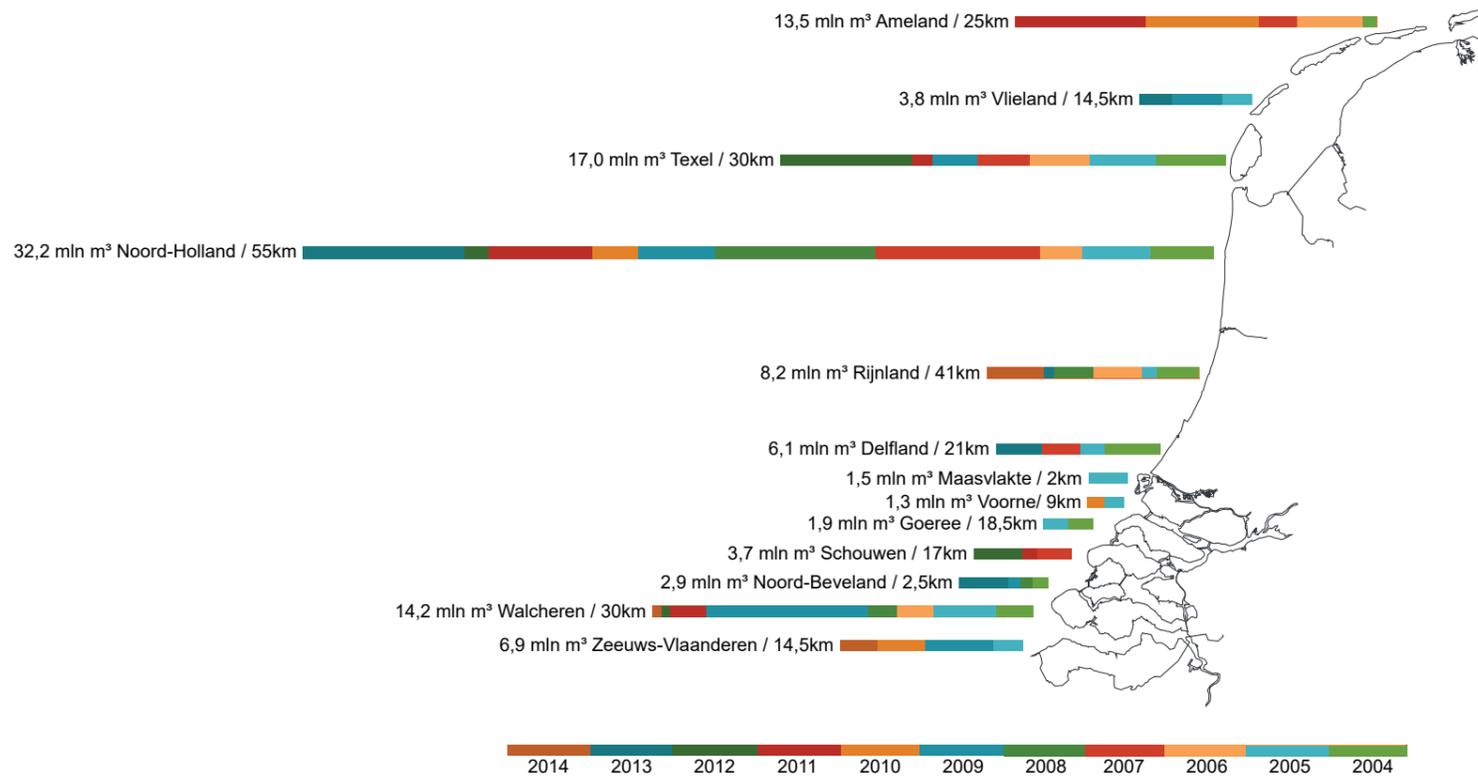
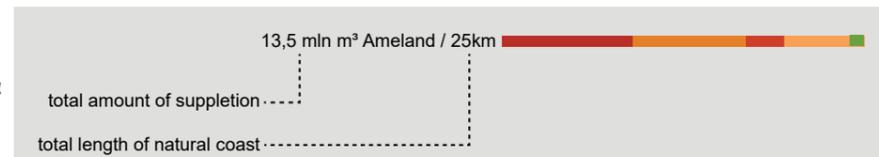


fig.1.1 | RB
Sand suppletion: Ameland in regard tot total Dutch coast line
source: Kustlijnkaarten, Rijkswaterstaat, 2014



sand balance	embryonic dunes	drifting beach ridges	carved beach ridges	parabolic beach ridge	washover	'slufter'
all sand is needed to guarantee safety	✓	✗	✗	✗	✗	✗
small single ridged dunes	✗	✗	✗	✗	✗	✗
dikes in sand	✓	✗	✗	✗	✗	✗
connecting structures	✗	✗	✗	✗	✗	✗
more sand available than needed to guarantee safety	✓	✓	✗	✗	✗	✗
border land/sea can be placed further land inwards	✓	✓	✓	✓	✓	✓
island tails	✓	✓	✗	✓	✓	✗
island heads	✓	✓	✓	✓	✓	✗
growing shores	✓	✓	✓	✓	✓	✗
coastal expansion	✓	✓	✓	✓	✓	✗

fig.1.2 | RB
applicability different types of dynamic coast management
source: Rijkswaterstaat (2015). Dynamisch Kustbeheer. Retrieved on 8 October 2015 via www.dynamischkustbeheer.nl

DYNAMIC COAST MANAGEMENT SUSTAINABLE SAFETY OR OUTRIGHT DANGEROUS?

By Roel Bekkers

Since 1990 the protection of the coast line is the responsibility of “Rijkswaterstaat”. They have to make sure the coast stays save and dry. For the Wadden islands this means the island cannot lose any land. Because of the rising sea level, the

islands needs to grow accordingly. Today the Dutch coast line is being strengthened by a method of sand suppletion, on effort which increases year by year. Recently state secretary Dijkma proposed a plan (“Natuurambitie grote wateren 2050 en verder”), in which she pleads for a more dynamic coast line control. In this report Ameland was named to benefit from such an approach. The people of Ameland however are quit sceptical about the news. “An islander does not flood his land!” [Quote from major Albert de Hoop in Trouw in response to the plans drawn up by state secretary Dijkma]

Ameland’s power of attraction is not to be taken for granted. A lot has changed in the timespan of the first inhabitation of the island around the year 850 until now. In comparison to the mainland, the Wadden islands are known for their fast changing shape. Due to the wind and sea, the elements, the Wadden islands are in constant motion. The changing of the islands, the border of land and sea, happens mostly under influence of heavy storms. When the land gets flooded, the water leaves its mark. By the time of the year 1000 the first embankments were made to protect the land. By now the island is characterized by several dikes [fig 1.4].

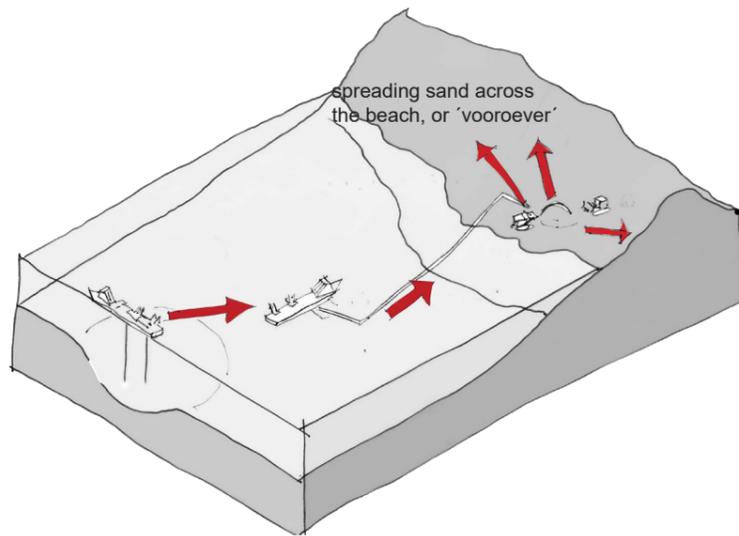


fig. 1.3 | RB
Principle of suppletion

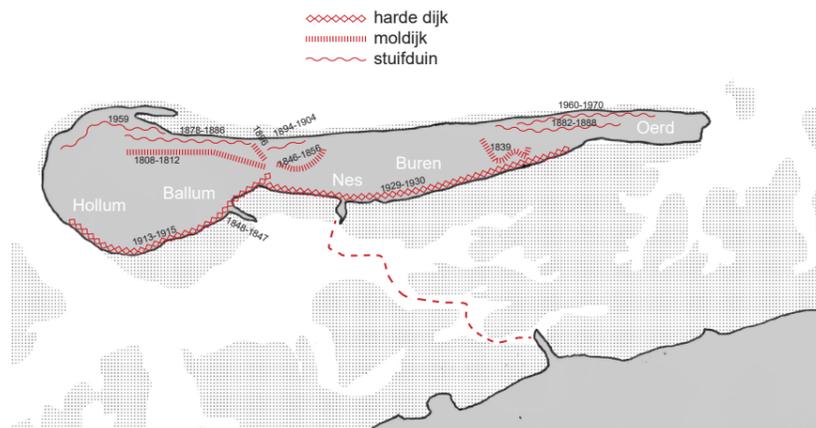


fig. 1.4 | RB
Historic dikes
source: R.Kiewiet (2014). *De invloed van de zee op Ameland*. Retrieved on 6 October 2015 via www.amelandhistorie.nl/news/de-invloed-van-zee-op-ameland/

The south side of the island is protected by a dike while the north sea side is protected by dunes.

Dynamics coast management was introduced in 1990 as a respond to the artificial regular coast management. One of the first projects regarding these new coastal management ideas were situated on Ameland. The island functioned as a test ground to examine and monitor the effects of a more natural alternative for coastal management.

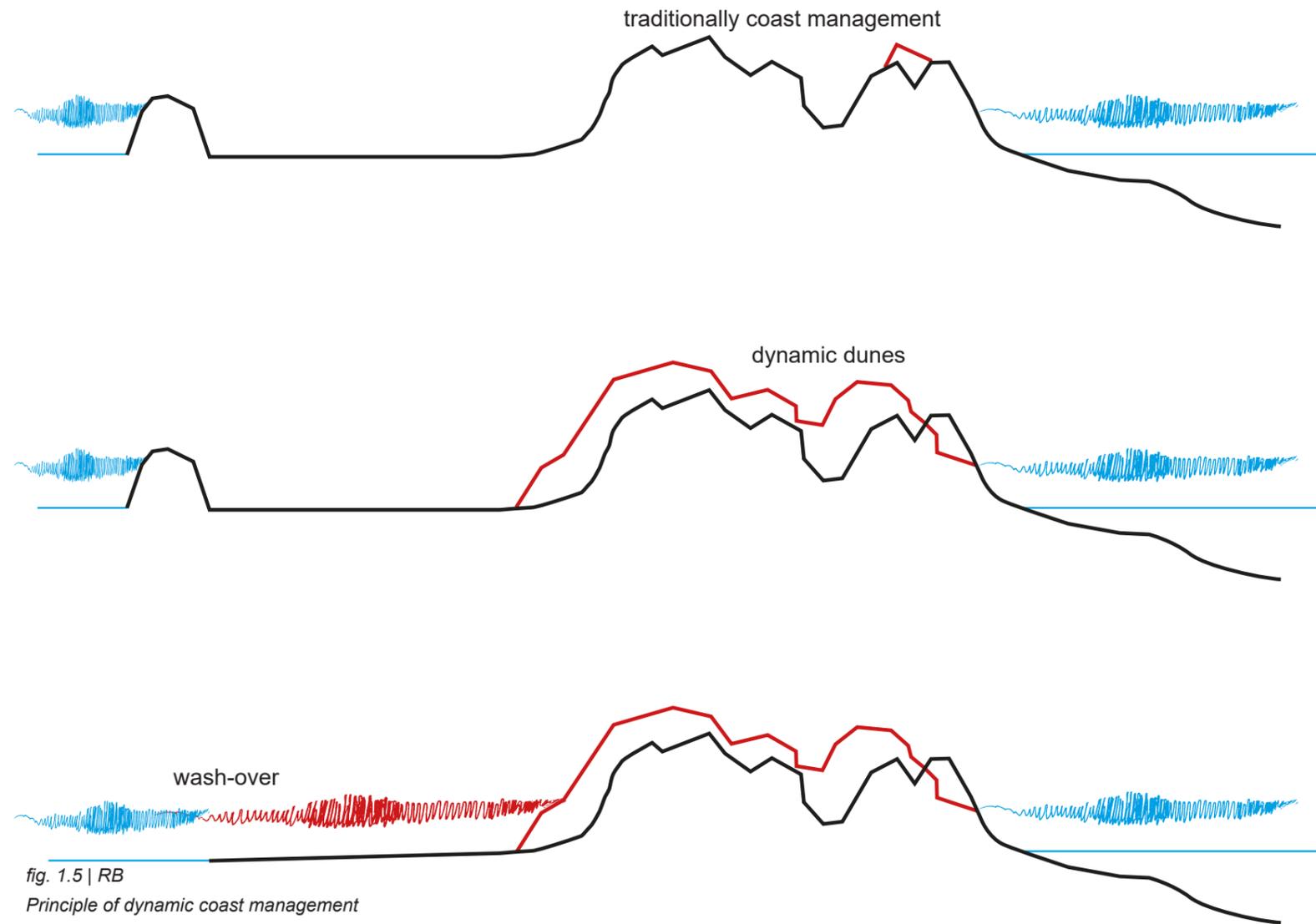


fig. 1.5 | RB
Principle of dynamic coast management
source: document PAS-analyse herstelstrategieën voor duinen Ameland, E.J. Lammerts, 2013

Dynamic coast management aims for sustainable safety. Dunes which are part of the coastal foundation should be able to grow with the rising sea level. Sand must be able to be blown from the beach into the dunes. Dynamic beach ridges function as service hatch to hold the sand and pass it on through the dunes, making it possible for the dunes to grow. A strategy to a dynamic coast can be implemented in various ways, under varying conditions [fig. 1.2].

Dynamic coast management is not always possible. First of all it is important that the safety of the hinterland stays guaranteed. Besides that, some coastal dynamics are hard to combine with the current use of the coast, such as recreation. The possibilities for introducing these dynamics are different for each coast typology. Which measurement are causing a more dynamic coast is different. Some will originate spontaneously while others need a human intervention to start the dynamic process.



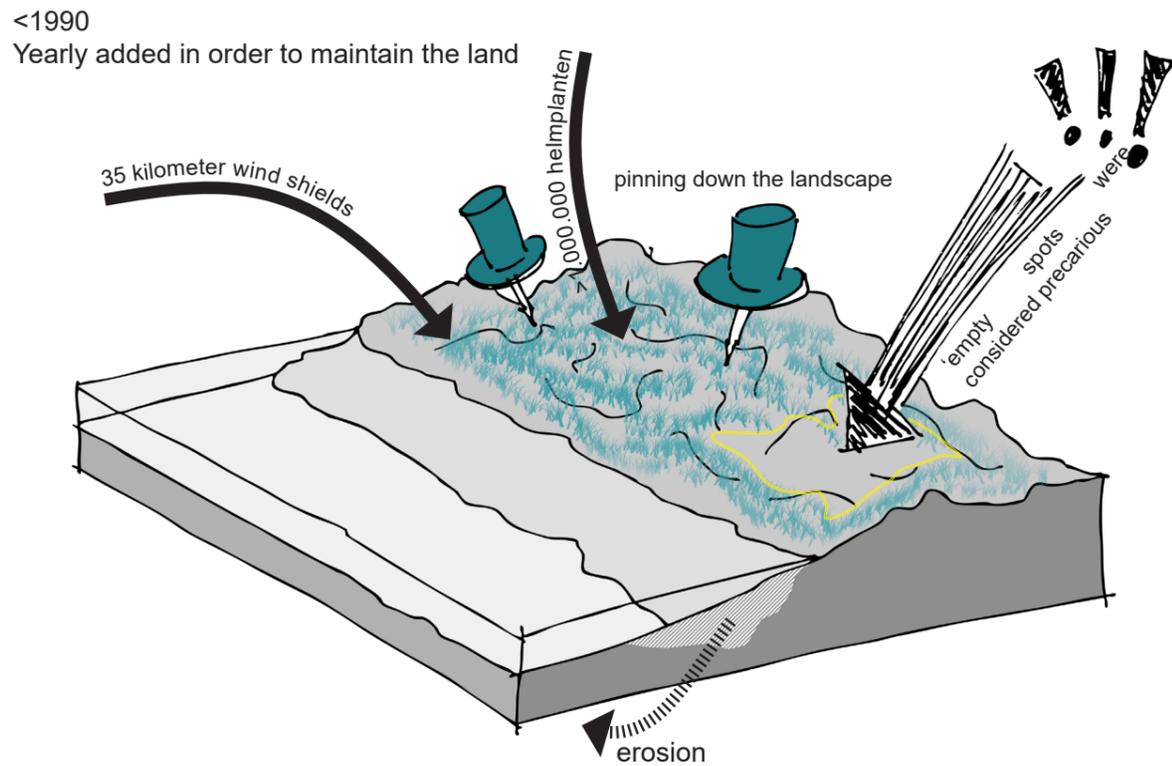


fig. 1.6 | RB
Traditional coast management

An example of a spontaneous form of coastal dynamics are the origination of embryonic dunes. These low dunes, partially overgrown by vegetation, are the start of what might become a dune. Embryonic dunes are buffers for safety and reduce the amount of water that flows towards the primary embankments.

A wash-over or a 'slufter' is usually in need of human intervention to

start the dynamic process. A wash-over consists of a breakthrough of the dike. A wash-over becomes active during storm, high water enters the land and leaves sand and slit. This process rejuvenates the vegetation and the wash-over grown along with the rising sea level. A wash-over is characterized by the many transitions from salt to fresh water, from wet to dry and from sand to slit.

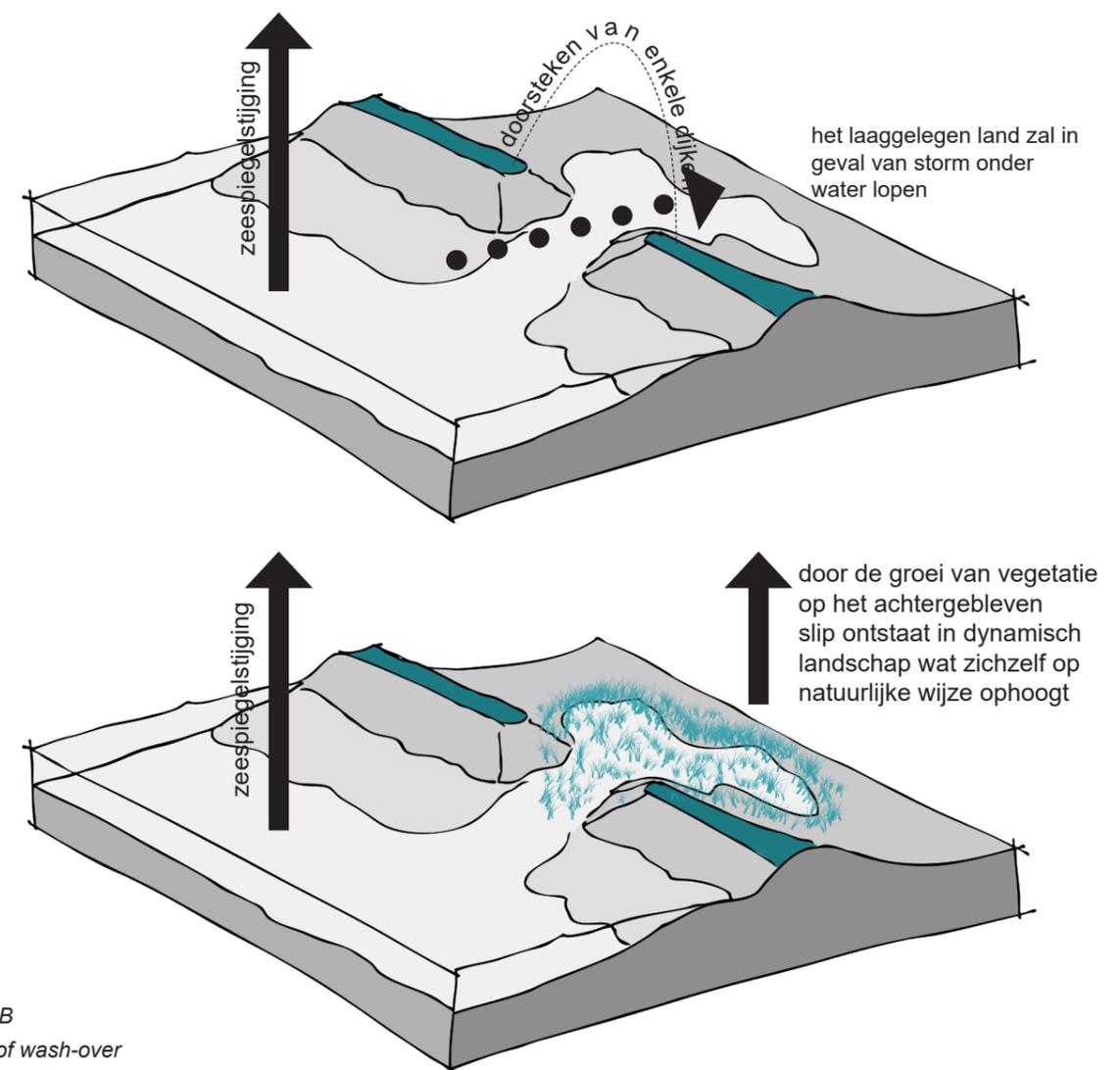


fig.1.7 | RB
Principle of wash-over
source: Rijswaterstaat (2015). Dynamisch Kustbeheer. Retrieved on 8 October 2015 via www.dynamischkustbeheer.nl

“Alterations of land and sea are indissoluble connected to the Wadden islands. The wind and the sea make of the islands a very dynamic area in which composition and decomposition constantly alternate in a natural way.” [Eilanden Natuurlijk, Löffler, 2008]

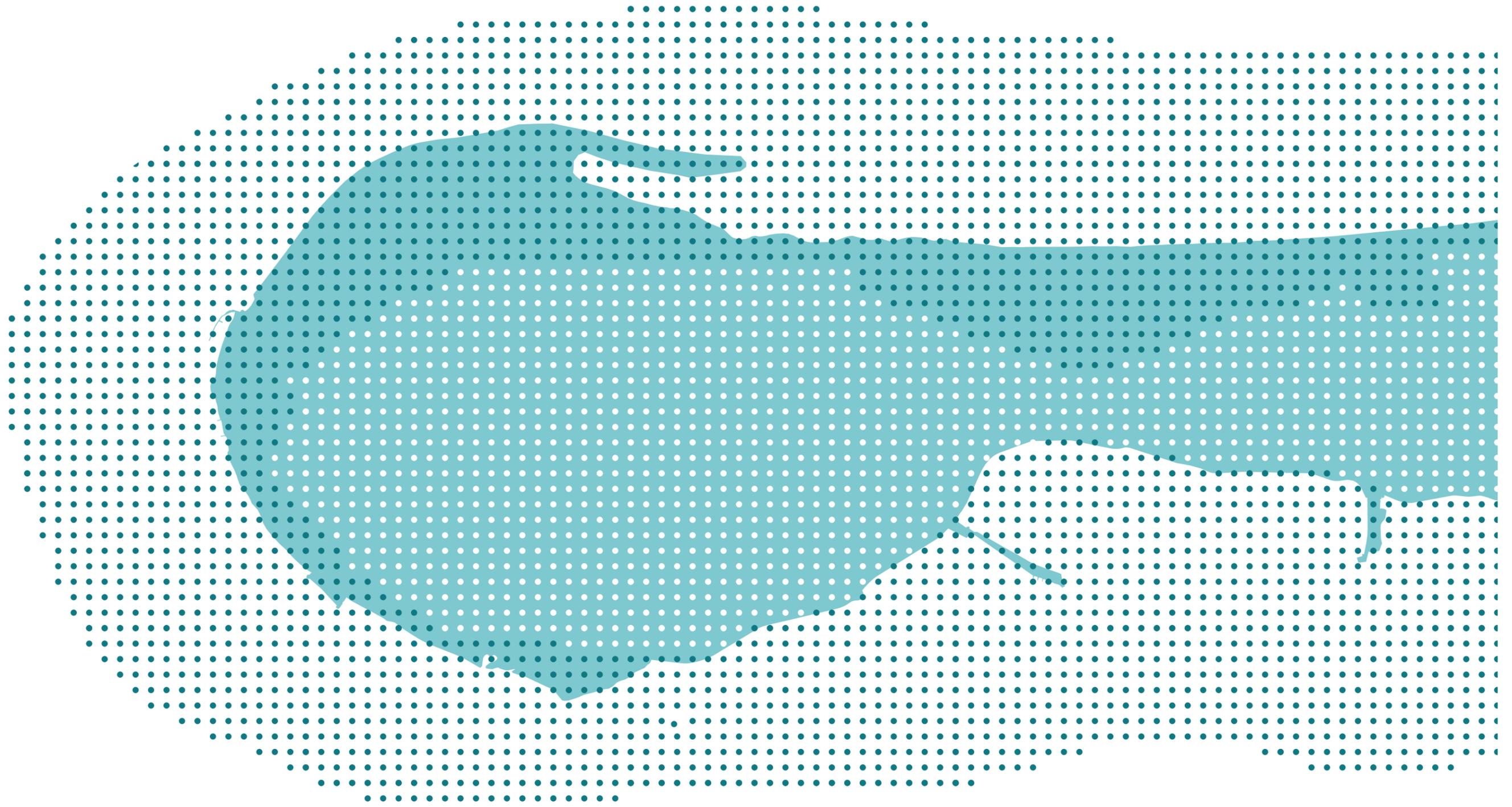
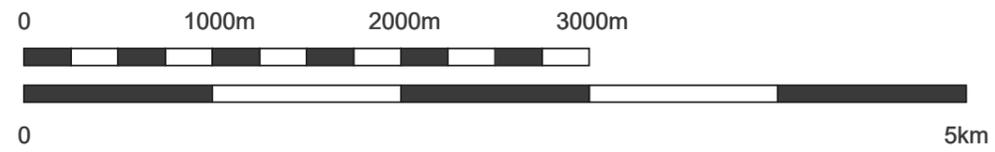
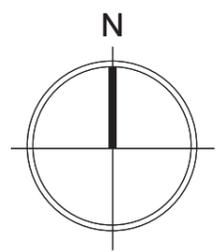


fig.1.8 | by RL
Natural Dynamics



- high dynamic landscape
- low dynamic landscape
- non dynamic landscape



SOIL & SUBSOIL

PRODUCT OF NATURE, PRODUCT OF MAN

By Nafthaly de Graaf

Nowadays, human influence the Wadden Sea to such an extent that the impact might be considered a “geomorphological force” in its own right. This influence causes the Wadden Sea area to deviate in its morphological structure and development from the natural situation.

Ameland as part of the Wadden Sea originated some 8000 years ago when the sea level rose after the last glacial. In the past 500 years the influence of man continued to increase. Especially in the 20th century, man had great influence through the reclamation of new areas of land. The times of active landforms are gone but not

the influence of man. Much less visible are current attempts to use the rich soil of the Wadden Sea for economic gain. Already started and pending drilling activities for gas and rock salt will have effect on the soil of Ameland. Delving of these substances will result and is already resulting in subsidence. The discovery of thermal water in the subsoil will pose a different kind of effect on the landscape of Ameland.

Geomorphological development

During the last glacial (Weichselien) ending about 11500 years ago, most of the North Sea was land. When the continental icesheets started melting, sea level rose rapidly, forcing the shoreline to recede and flooding the presentday North Sea. Smaller barrier

islands or beach ridges were probably present in front of the coast as relicts of Pleistocene headlands. In the course of the Holocene, the barrier islands and tidal basins shifted landward as sea level continued to rise rapidly. The sea broke trough the ridges and swept away most of the peat, creating the Wadden islands. First major human interference started from 900 CE. Dikes were build and land was reclaimed but often breached by the sea. Battle with nature turned in favour of mankind from 1500 CE onwards. But even then, Ameland is part of a high dynamic landscape. Parts of the island will be reclaimed by the sea while at te same time, new areas will grow and land will be added by nature.

Two major groups of influence can be destinguished (Wiersma et al., 2009):

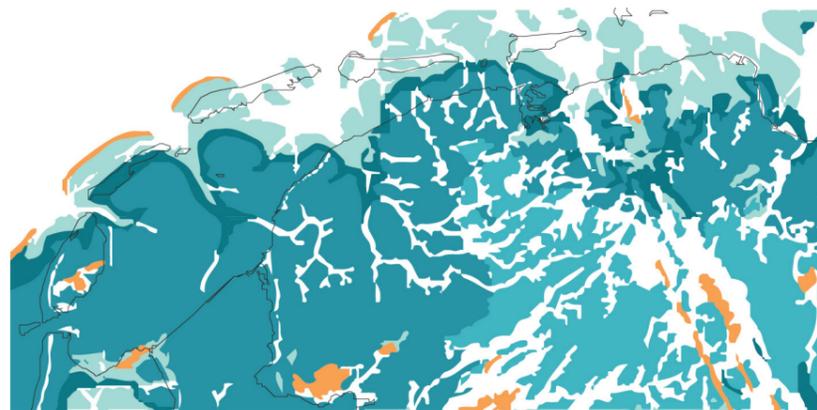


fig.2.1 | by NdG
The Wadden, 5500 BC

source: Waddenacademie (2015) Various documents. Retrieved on 8 October 2015 via www.waddenacademie.nl

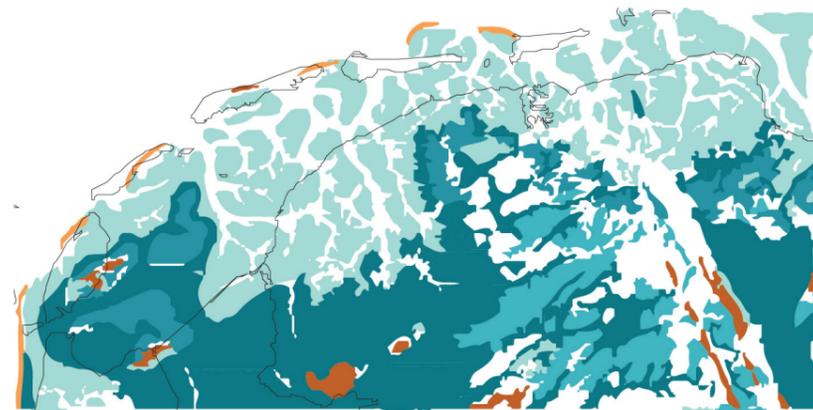


fig.2.2 | by NdG
The Wadden, 2750 BC

source: Waddenacademie (2015) Various documents. Retrieved on 8 October 2015 via www.waddenacademie.nl

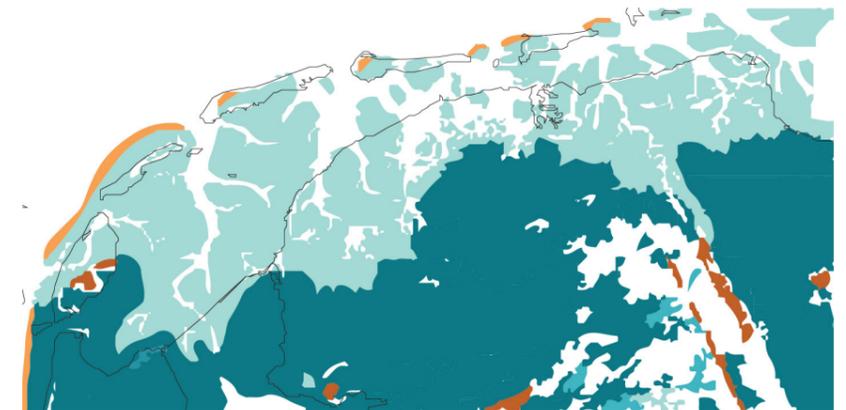
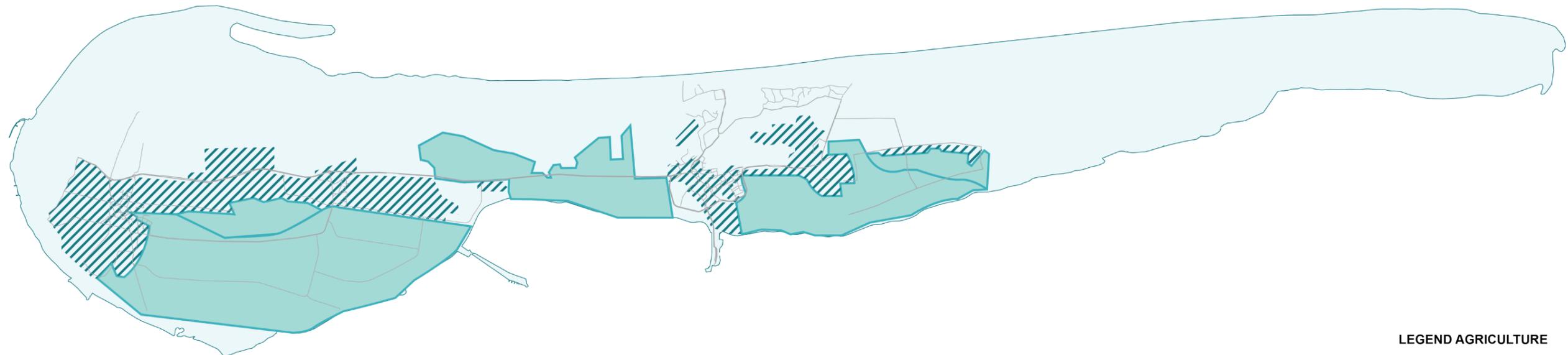
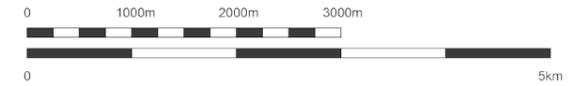


fig.2.3 | by NdG
The Wadden, 500 BC

source: Waddenacademie (2015) Various documents. Retrieved on 8 October 2015 via www.waddenacademie.nl



LEGEND AGRICULTURE

-  Development professional agricultural / dairy farming
-  Search area development hobby- and part-time sector

fig.2.7 | by TB

The zoning is based on the following criteria; Professional farmers need to develop where the European, national, provincial (and municipal) laws and regulations are allowed. Part-time farmers develop primarily around the villages on marginal land and in vacant agricultural buildings. Hobby Farmers develop mainly around the villages and the marginal land.

source: Structuurvisie Ameland, Inbo, 2010

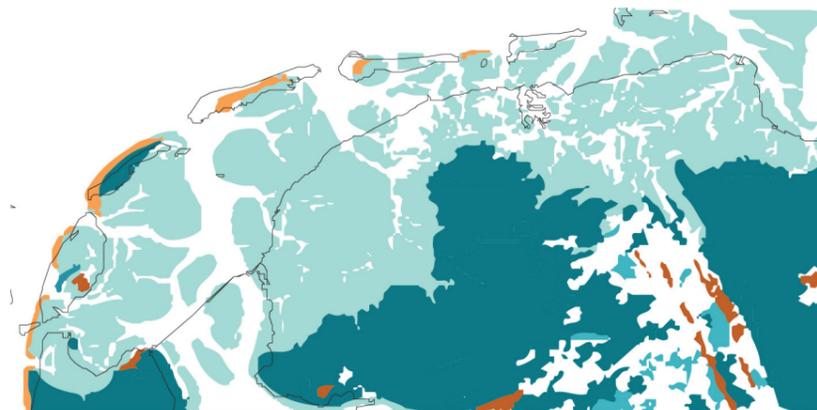


fig.2.4 | by NdG
The Wadden, 800 AD.

source: Waddenacademie (2015) Various documents. Retrieved on 8 October 2015 via www.waddenacademie.nl

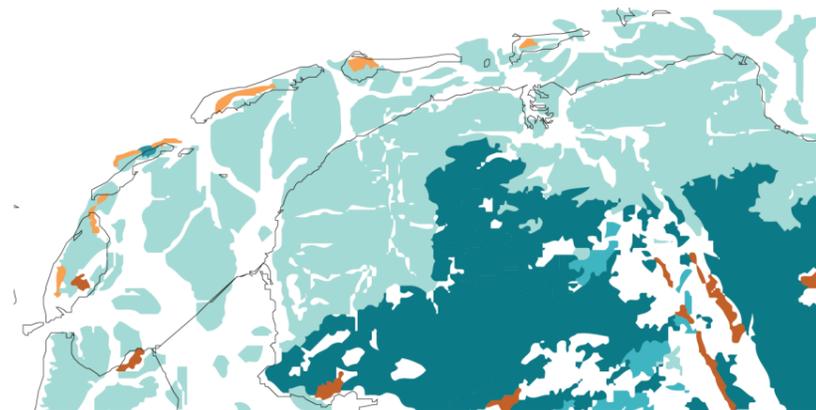


fig.2.5 | by NdG
The Wadden, 1500 AD.

source: Waddenacademie (2015) Various documents. Retrieved on 8 October 2015 via www.waddenacademie.nl

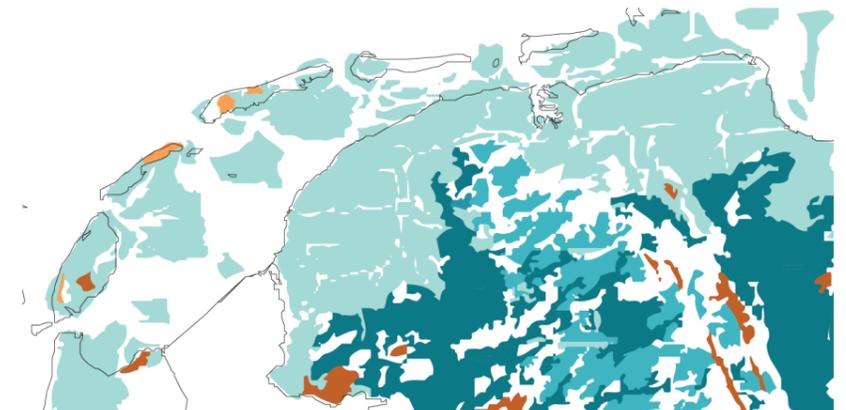


fig.2.6 | by NdG
The Wadden, 1850 AD.

source: Waddenacademie (2015) Various documents. Retrieved on 8 October 2015 via www.waddenacademie.nl

2050
sea level

2030
sea level



CLIMATE

By Roel Bekkers

CLIMATE - The climate of the Wadden area is comparable with the rest of the Netherlands. However, when you are surrounded by water like an island, safety and the protection against flooding are always important. To maintain the land there must be a constant suppletion of sand. Due to the rising sea level, the amount of these suppletions are increasing year by year [fig. 3.1].

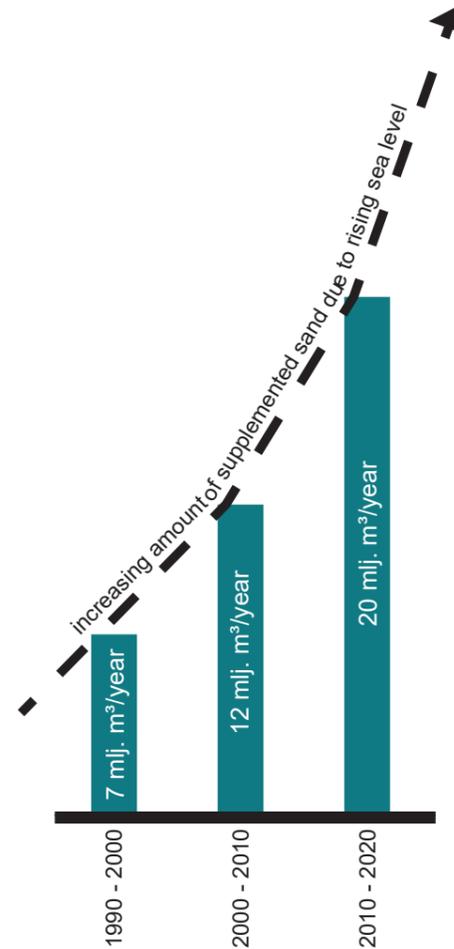


fig. 3.1 | RB
 rising sea level has huge effect on sand suppletions
 source: Ecomare (2014). Zandsuppletie. Retrieved on 25 September via www.waddenzeeschool.nl

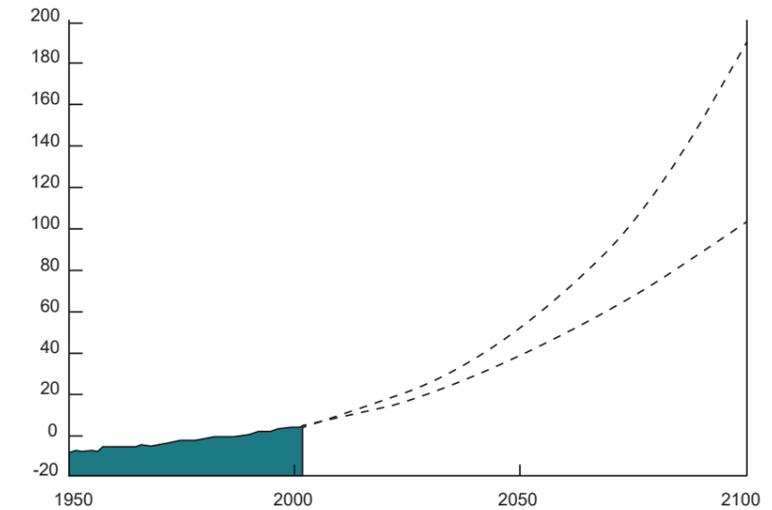


fig. 3.2 | RB
 prognosed sea level rise
 source: Global sea level linked to global temperature, Martin Vermeer, 2010

WEATHER

By Roel Bekkers

WEATHER - According to the Dutch weather institute (KNMI) the Wadden area has the fewest summer days per year of the entire country. Days with maximum temperatures of above 25 degrees are quantified as summer days. The Wadden area has 5 of these days per year while the southern part of the Dutch North Sea coast has got 15.

This being said, there is actually very little climatological difference between the Wadden area and the rest of the Netherlands, except the influence of “island behavior”.

This phenomenon causes a shift and flattening of weather extremes under influence of sea water. In springtime when the inland is rapidly warming up, the islands are kept a bit cooler by the cold water of the sea. This is why early in the season there are more sunny days on the islands because the rain will fall on the mainland. The same thing happens in the fall when the mainland is cooling down, the sea water will keep the islands relatively warm causing sometimes

heavy rainfalls. In springtime the island is a bit colder and a bit sunnier and in the fall the island is a bit warmer and wetter.

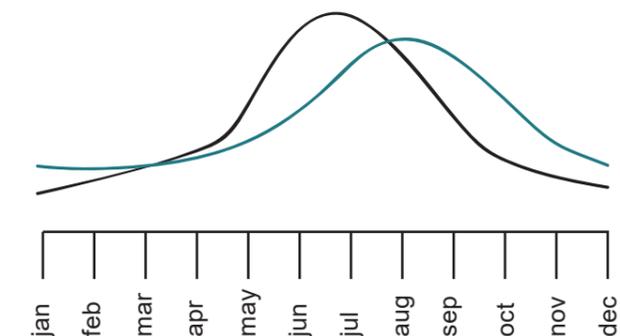


fig. 3.3 | RB
 “island behaviour”: temperature on the islands in blue, mainland in black

A BRIEF HISTORY

HIGHLIGHTS OF THE LAST DECADES

By Robbert Lancel

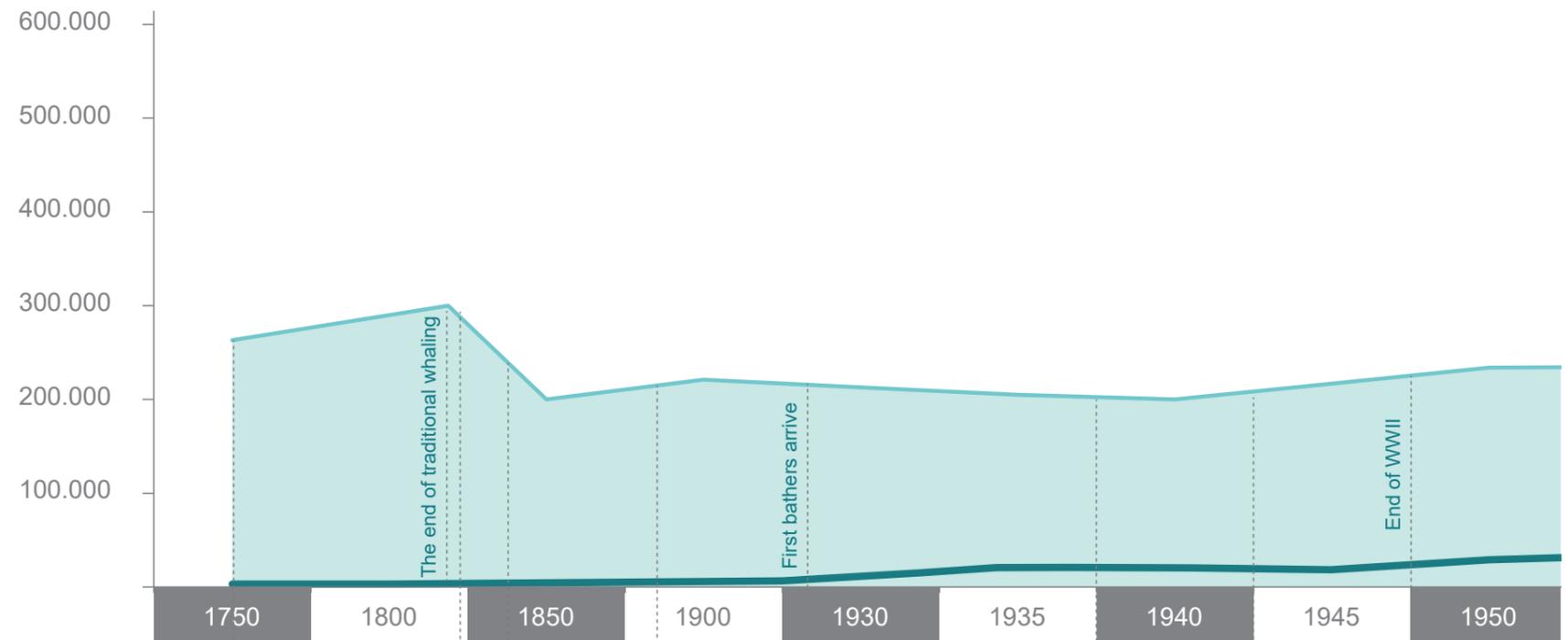
Since 1801 [4.1] Ameland is one of the four inhabited Wadden islands of the province of Friesland, which like the other inhabited islands in the Wadden Sea now flourishes through tourism. However, it hasn't always been like this.

The young island has a relatively short history. As an independent mini-state, the island has managed to form itself the past centuries in an environment which was continuously under the influence of the elements, the sea took and the sea gave. Many years the islanders lived off beachcombing, stock breeding, farming, fishing, shipping merchandise and whaling in the northern Arctic Ocean [4.2]. After World War II when also whaling came to an end the focus shifted to tourism as a new economic engine for the island. Mostly Dutch and German tourists flocked to the mud flats, dunes and beaches where the air is clean [4.3]. But also the villages where time seems to had stand still for the characteristic commodore houses, are typical of the conserved landscape of Ameland.

4.1 | *Ameland van Oost tot West*, H. Bakker, 2006

4.2 | *Sorgdrager Museum*, 2015

4.3 | *Het ontstaan en de toename van het Duitse toerisme op Ameland*, E. Hooijenga, 2014



In the seventeenth and eighteenth century Ameland knew a period of unprecedented prosperity due to whaling. Especially a lot Amelanders at that time were involved in whaling. Numerous historical buildings in Hollum, Ballum and Nes remind us of that rich period of time of the commanders. One of the best-known Amelanders commanders of that time was "Dirk Hidde Kat".

In 1798 Ameland lost its independence. After the French period and the founding of the United Kingdom of the Netherlands in 1815 the island became part of the province of Friesland.

Once Ameland was artificially connected to the mainland, viz. in 1871, but the dam was not a great success and in 1882 she was completely swept away by the sea.



In 1824 the first lifeboat, until 1988 traditionally pulled by horses into the sea, was already positioned in Ameland. Since that time hundreds of castaways have been rescued from their stranded vessels. Nowadays the boat, pulled by horses goes out annually to demonstrate how it used to go back in the days.



Together with the other Wadden Islands, Ameland formed a part of the 'Atlantikwal' defense line of the Germans along the coast of Europe during WWII. Ameland was occupied territory, but no battlefield.

Due to storm and sand drifts three villages disappeared into the sea in the 16th century. Constantly the sea breaks off the land. In 1935, for that reason the badhotel had to be demolished. In one of the nights in February 1953 entire dune ranges disappeared into the sea.

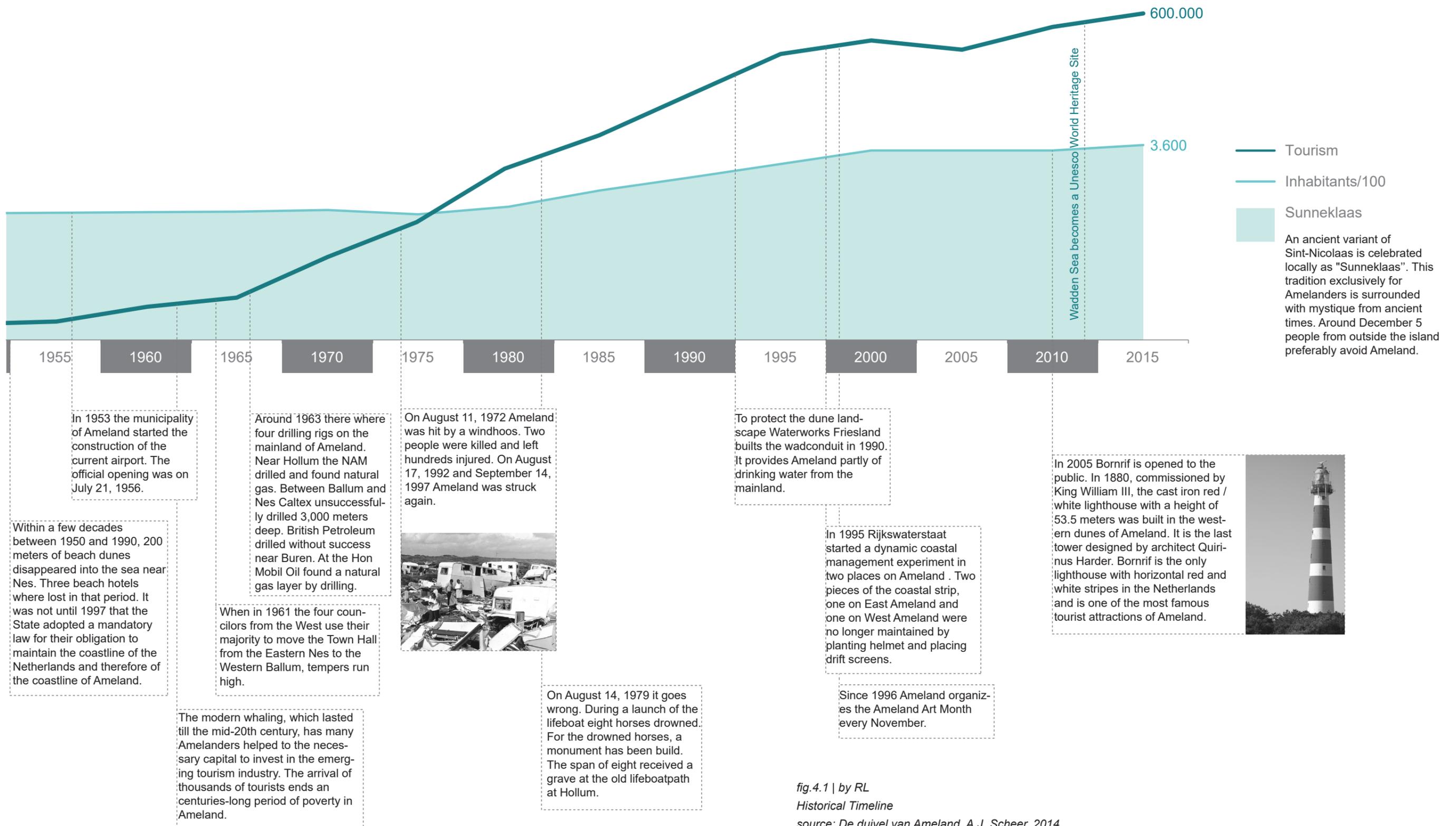


fig. 4.1 | by RL

Historical Timeline

source: De duivel van Ameland, A.J. Scheer, 2014

Kiewiet, R (2015). De invloed van de zee op Ameland. Retrieved on 1 October 2015 via <http://amelandhistorie.nl>

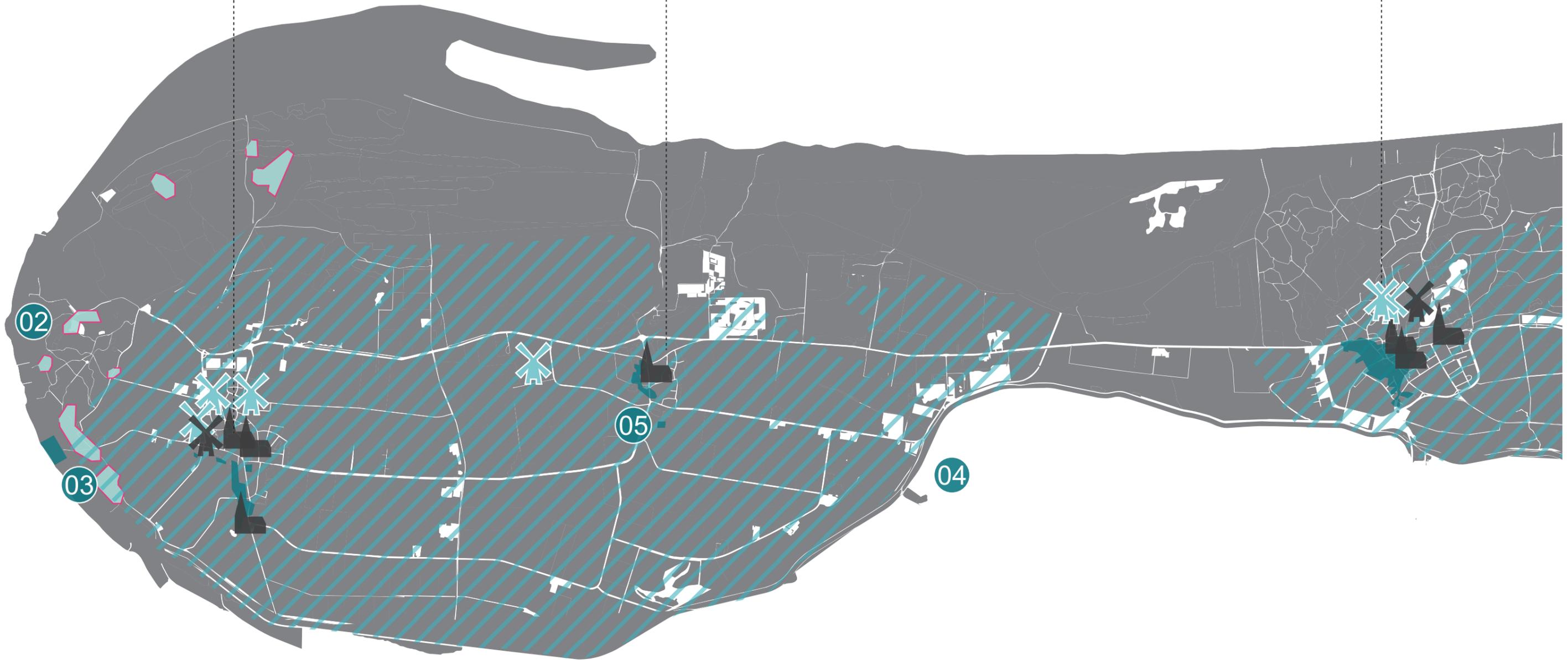
Volkers, K (2002). De dam naar Ameland. Retrieved on 1 October 2015 via www.volkskrant.nl/archief

Sorgdrager Museum, 2015

Hollum 52 national heritage sites

Ballum 12 national heritage sites

Nes 48 national herita



The Camminghaslot which was founded by Ritske of Jelmera dates from the early fifteenth century and was originally called the Jelmera State. Later the building was known as the castle Cammingha. For centuries the castle, located south of Ballum and surrounded by vast forests and gardens, was the jewel of Ameland.

In 1604 the castle was completely renovated in renaissance style with lavish decorative elements (northern mannerism). The appearance is similar to the Heringastate to Marssum but the Camminghaslot was much larger.

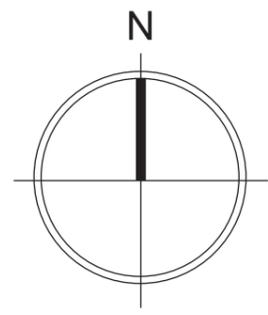
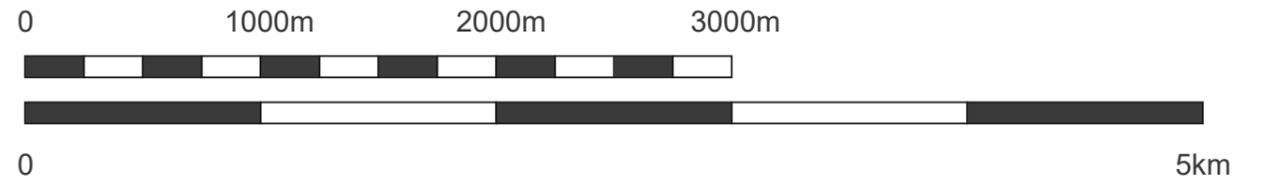
In 1828 the castle was declared uninhabitable and completely demolished.



Over the course of time approximately ten mills have existed on the island. The current mill 'Phenix' in Nes has had two predecessors. The corn and mustard mill 'De Verwachting' in Hollum is rebuilt at the exact same location as where in the last century its predecessor was located.

Back in the days millers bought the patent from the "Heer van de Vrije Heerlijkheid" to be allowed to catch his wind.

ge sites **Buren**



-  archaeological value (residues from the period of Iron Age - Middle Ages)
-  high archaeological value (remains from the Bronze Age period)
-  strategic artillery positions/ shelters Atlantikwall WWII
-  church
-  lost mill
-  rebuild mill
-  01 former 'verbindingsdam' Friesland/Buren
-  02 lighthouse "Bornrif" 1880
-  03 horse grave
-  04 old harbour pre-WWII
-  05 Camminghaslot

01



The "commandeurswoning" on Ameland, the house of one of the captains of a (whaling) ship is recognizable by the double row of protruding bricks in the façade and the iron anchors indicating the year of built. Most commodore houses date from the period between 1650 and 1800.

The mice teeth, stone ledges or jagged edges in the facade indicate the rank of the sailors homes; the more toothed ledges, the higher the rank.

Virtually all commodore houses are national heritage sites and are now often used as holiday accommodation.

fig.4.2 | by RL
 Historical Valuemap
 source: Adellijk wonen in Friesland, Stinsen en States, 1992
 Friese Archeologische MonumentenKaart Extra, Provincie Fryslân, 2015

MORPHOLOGY

OF CLASSIFIED BUILDINGS UNTIL FRAGMENTATION OF THE LANDSCAPE.

By Joost van der Zanden

From 1832 Ameland is brought up to a cadastral map [5.1]. Because there couldn't be referenced from a solid measure point the church tower was chosen as zero [5.2]. How the building has developed from then on, is brought up in a map with 6 periods of time. These different times of building morphology are collected and reproduced in a total survey.

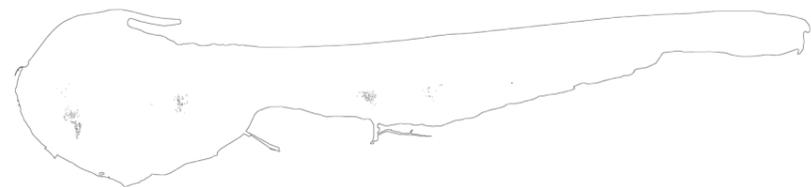
Prognoses - The chapter tourism shows us that this sector will keep on growing. This will lead to a further condensation of the holiday districts. Also the agricultural firms are transforming to group accommodations and lodging-houses.

5.1 | Kadaster Leeuwarden (1832) Cadastral map 1832. Retrieved on 2 October 2015 via <http://194.171.192.4/>

5.2 | Bleeker, Jan (2011). Ameland te kaart. Retrieved on 2 October 2015 via <http://amelandtekaart.webklik.nl/page/ameland-te-kaart>

Morphology <1832

Villages are self-contained clusters with an individual dyke-ring. Building and habitation within this cluster is in the west and east of the agriculture. Elsewhere on the island is no building present except the little hamlets 'De Blijke' north of Hollum and 'the Kooiplaats' east of Buren.



Morphology 1832-1930

Because of the investment in the agriculture sector, individual dyke-rings were replaced by one dyke-ring. Areas in-between the villages are being used on behalf of agriculture and grassland. Remarkably there doesn't arise building outside the villages. Except around Nes there are a few agrarian businesses coming into being, north and west of the island.



Morphology 1930-1960

North of Nes and Buren the first holiday bungalows are arising at the cost of the agriculture. At west of Hollum there is also an ribbon of buildings with holiday cottages constructed. The agriculture sector replaces and intensifies itself between Hollum and Ballum where various farming industries arise.

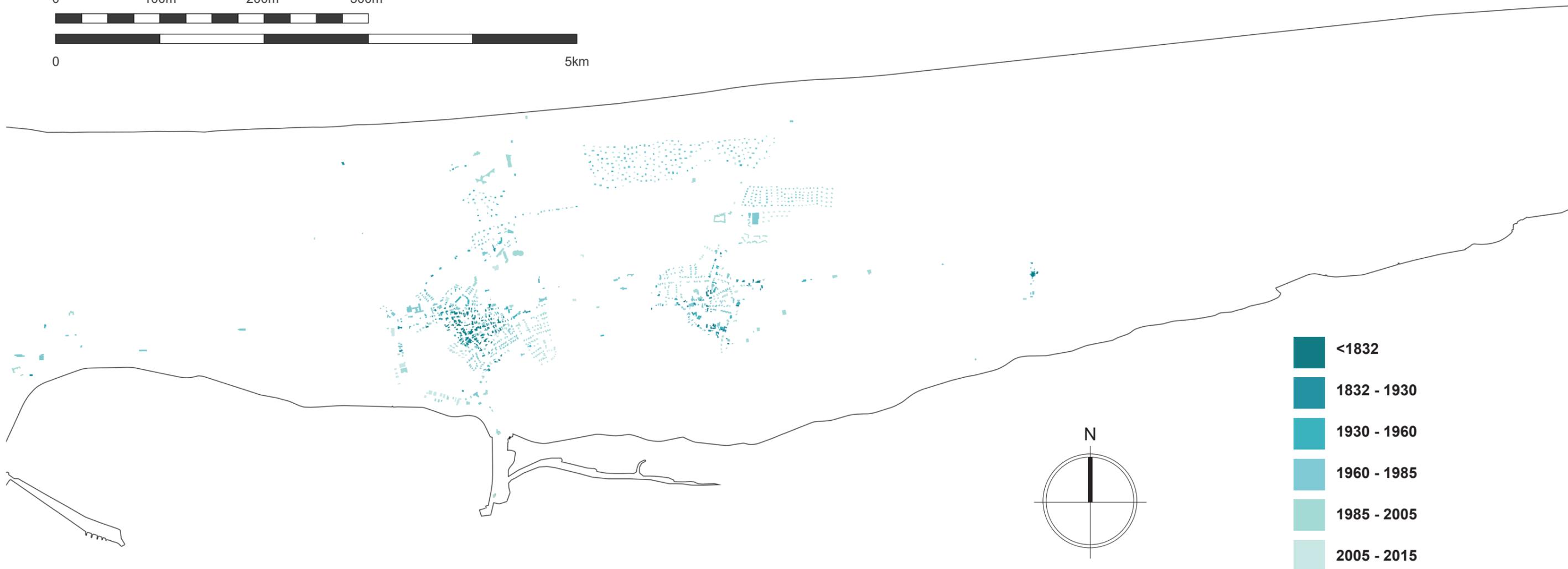


0 100m 200m 300m



0

5km



Morphology 1960-1985

In this period there is an explosive grow of building. Various expansion districts are built around the villages, but also complete holiday districts north of the villages are being built. This because of the constantly increasing demand of holiday cottages.



Morphology 1985-2005

The tourist sector keeps on growing so the holiday districts keep expanding, but also the small-scale accommodations around the farming industries keep growing. Because of the growing industriousness there are small industrial estates built: one east of Ballum and one southwest of Nes.



Morphology 2005-2015

Holiday districts keep on expanding but not in the same speed as the passing years. Only around Nes there are extra private houses being built at the edge of the village and the industrial estate of Nes expands.



ECONOMICS

RECREATION, THE ECONOMIC REAL ESTATES OF AMELAND

By Joost van der Zanden

Before the tourism was in its development, the agriculture together with the fishery and commercial traffic were the most important sources of existing in Ameland. Today there is still (commercial) agriculture on the island, however the tourism

leaves the agriculture and fishery far behind. But it is the same agriculture that demands the biggest part of the radiation of the island. The surface area of Ameland exists for over 92% [fig. 6.3] out of nature and agricultural land. This contains in sharp contrast with the economic value of it.

In the morphology development is shown that from 1930 many hotels and bungalows are built north of the island. These do have a higher economic value than the agriculture. In Ameland the land-

value of agriculture is very low [fig. 6.1]. This has its origin in the isolated location and because the land is only suitable for grassland and barely for agriculture.

Besides that Ameland contains for the biggest part out of agriculture, it barely consists 4% [fig 6.4] of the value of real estates. On the other hand there can be said that the recreation sector bears the value of Ameland these days. This because it contains almost 50% of the real estates in Ameland.



fig.6.1 | by JvdZ
The landvalue in Groningen and Friesland are the lowest of the Netherlands.
source: DCA Multimedia (2015). Landvalue of the Netherlands. Retrieved on 16 oktober 2015 via <http://www.boerenbusiness.nl/grondmarkt>

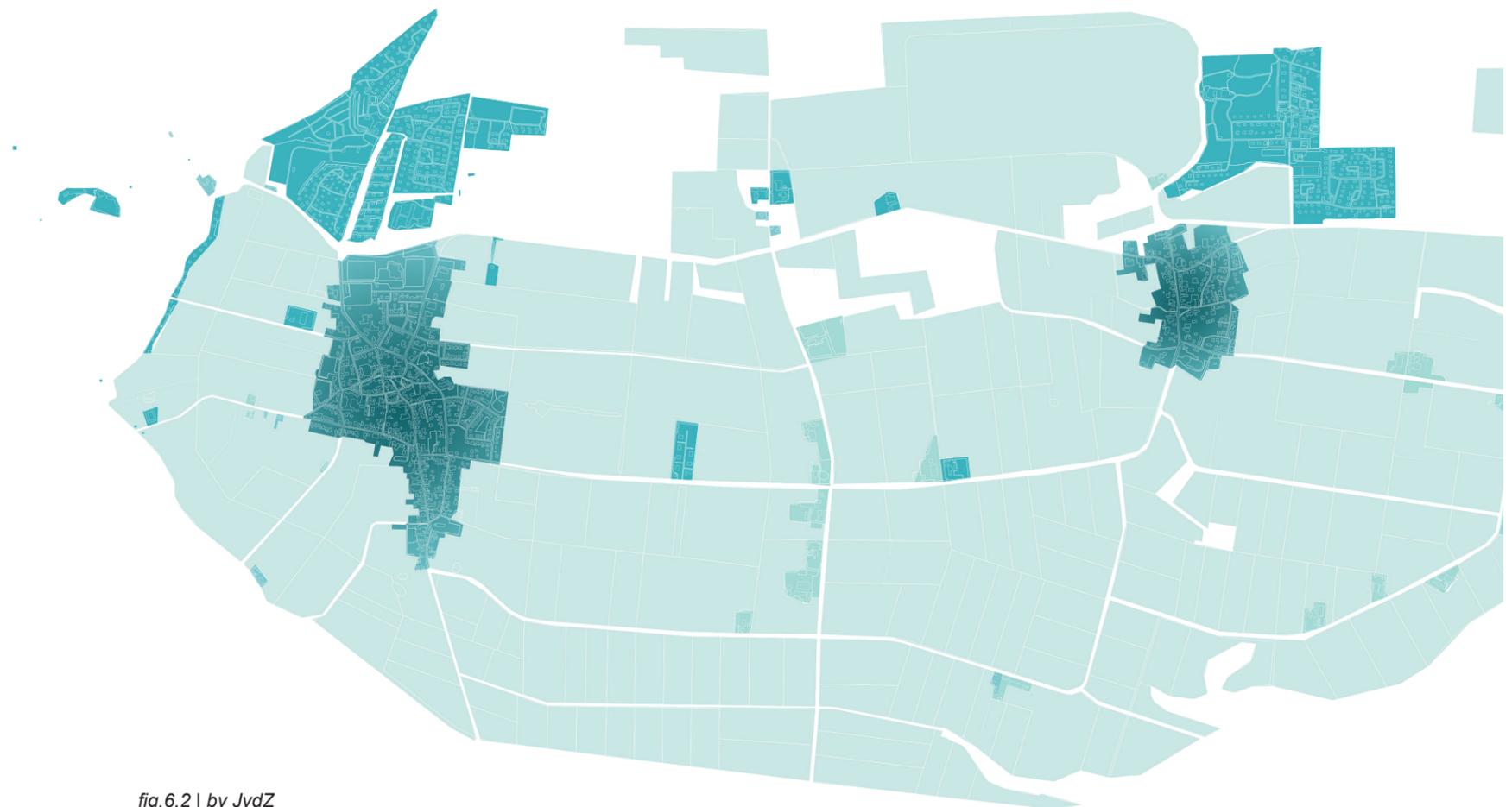


fig.6.2 | by JvdZ
Landvalue of Ameland
source: Gemeente Ameland, Nota grondprijzen 2011-2012, 2011
Statistics of Centraal Bureau voor de Statistiek, WOZ-waarde 2015, 2015

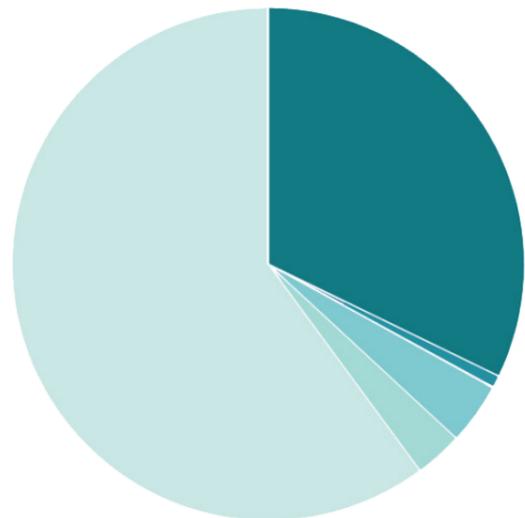


fig.6.3 | by JvdZ
The landvalue Ameland in [m²]
source: See appendix 2

- AGRICULTURAL LAND
- INDUSTRY / AGRICULTURAL COMPANIES
- HOUSES OUTSIDE THE VILLAGE
- RECREATION
- VILLAGES
- NATURE / INFRASTRUCTURE

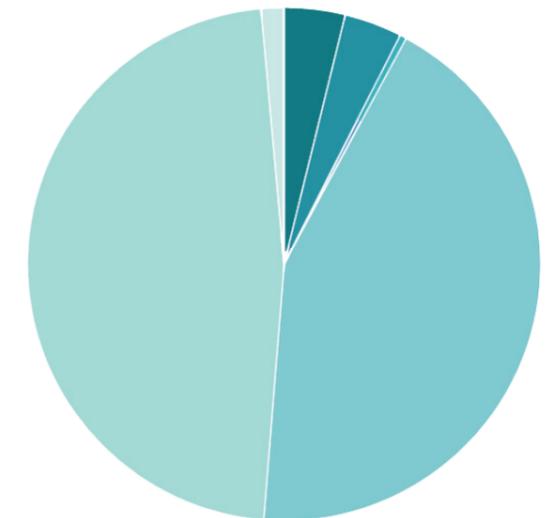
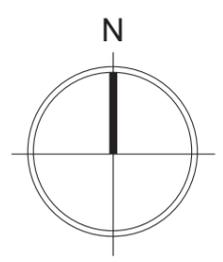


fig.6.4 | by JvdZ
The landvalue Ameland in [€]
source: See appendix 2



- ± € 700,- per m²
-
-
-
-
- ± € 5,- per m²

0 100m 200m 300m



THREATENED BY THE SEA

EVEN WITHOUT THE DYKE-RING, AMELAND STAYS ABOVE SEA LEVEL.

By Joost van der Zanden

According to the KNMI [7.1] the sea level will rise 15 to 85 cm in the next 100 years. The 4 villages of Ameland are located on high level mounds so they will remain dry during high tide. In its current situation the villages are located extensively above NAP.

Still there is some anxiousness which makes that there is lots of control in the Netherlands for the dyke- and dune raise. Also the dyke-ring, which exists from late 19th century, is consolidated and raised many times. Again a project of Witterskip Fryslan is started to raise and improve the 16km dyke of Ameland. So the raising contains while rapports of the dyke-ring 2 [7.2] show that the risks are a negligible factor. The project named 'Kijk op de dijk' [7.3] will cost in it's total around 77 million euro's. When the dykes will decline, no land will be lost in this current situation because of its location above NAP. When sea level will rise 1, 2 or 3 meter it does has its infect on the hinterland. Since the land that will be flooded contains grassland, it doesn't stand against the costs that are made maintaining the dyke-ring. Also the dynamic coastal management shows that washovers can remain as grassland for animals. Besides this the coastal managment makes the hinterland rise progressively with the current sea level [7.4]. So the question arise if the investment makes it worth it.

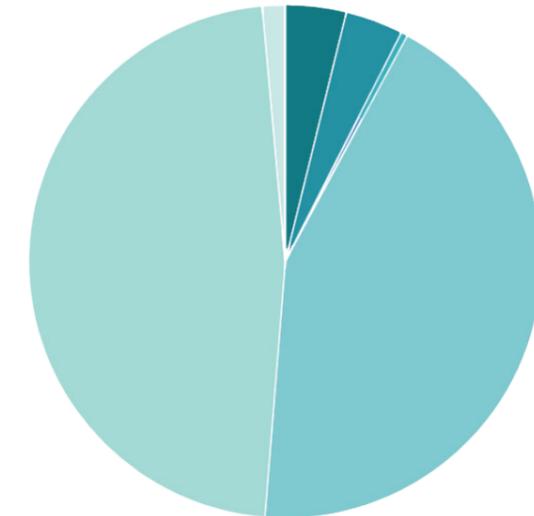
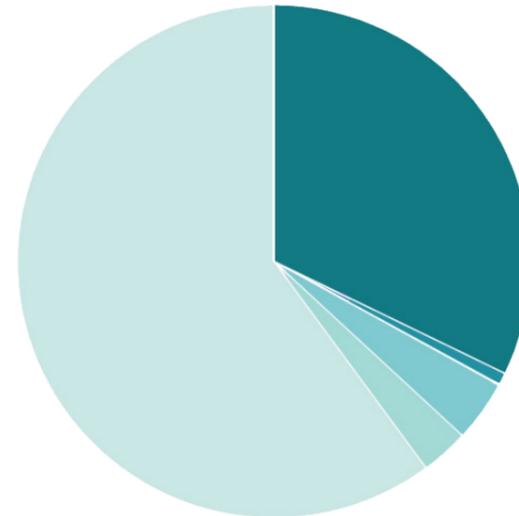
7.1 | *Klimaatschetsboek Nederland: het huidige en toekomstige klimaat, KNMI report, 2009*

7.2 | *Veiligheid Nederland in Kaart 2, M.J. van Reen (Arcadis), 2014*

7.3 | *Kijk op de dijk, Wetterskip Fryslân, 2015*

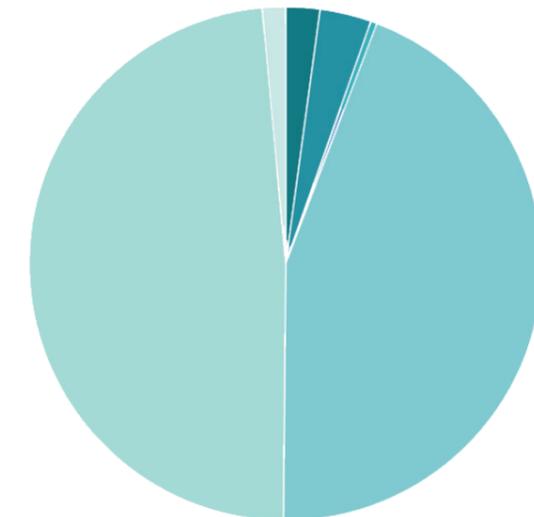
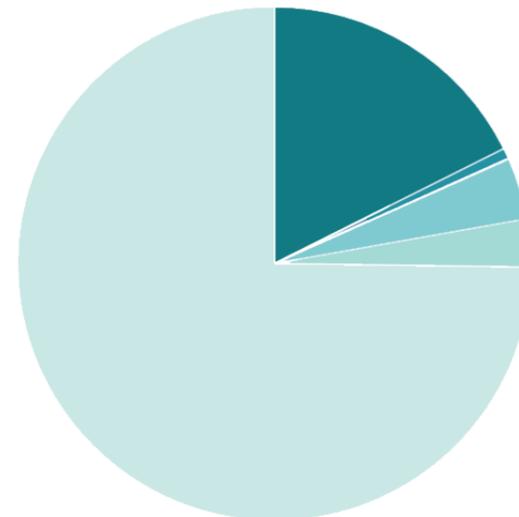
7.4 | *Chapter 1, dynamic coast managment*

SEALEVEL 1m +NAP



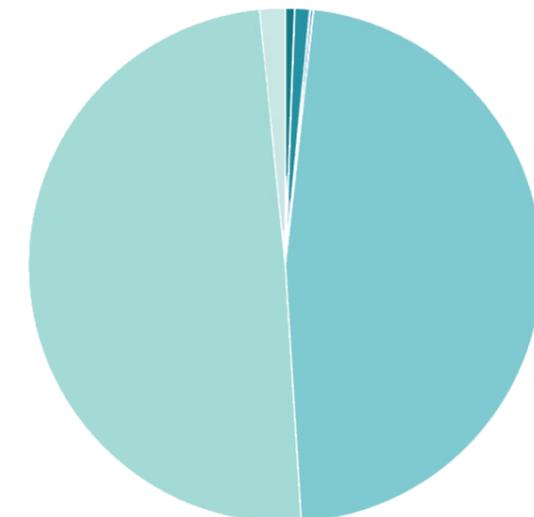
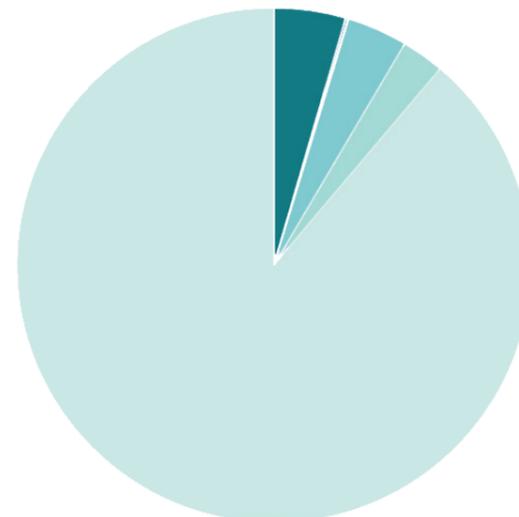
VILLAGES
NATURE / INFRASTRUCTURE

SEALEVEL 2m +NAP



HOUSES OUTSIDE THE VILLAGE
RECREATION

SEALEVEL 3m +NAP



AGRICULTURAL LAND
INDUSTRY / AGRICULTURAL COMPANIES

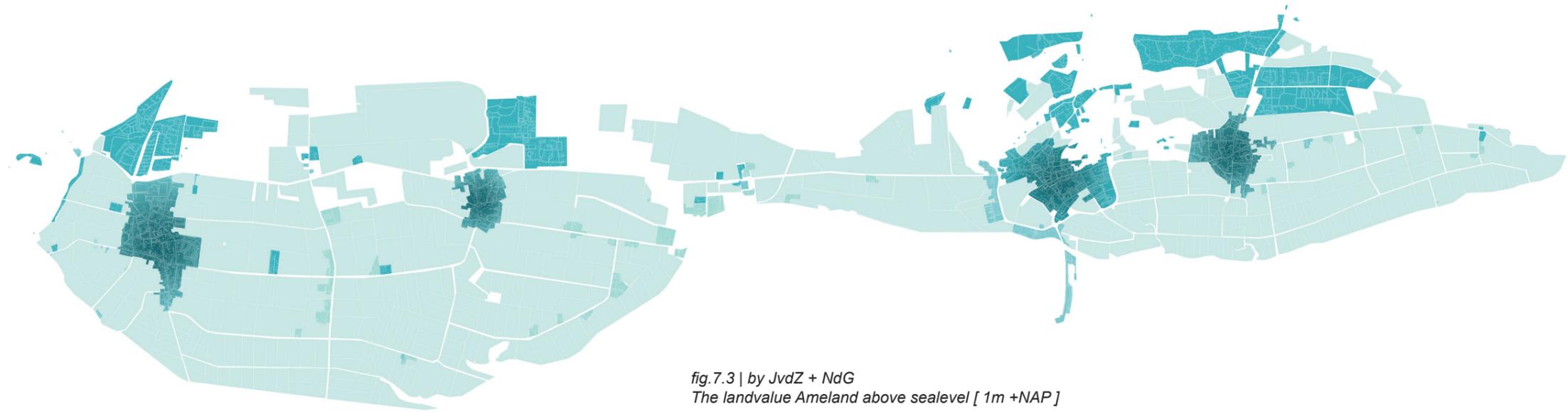


fig.7.3 | by JvdZ + NdG
The landvalue Ameland above sealevel [1m +NAP]



fig.7.6 | by JvdZ + NdG
The landvalue Ameland above sealevel [2m +NAP]



fig.7.9 | by JvdZ + NdG
The landvalue Ameland above sealevel [3m +NAP]

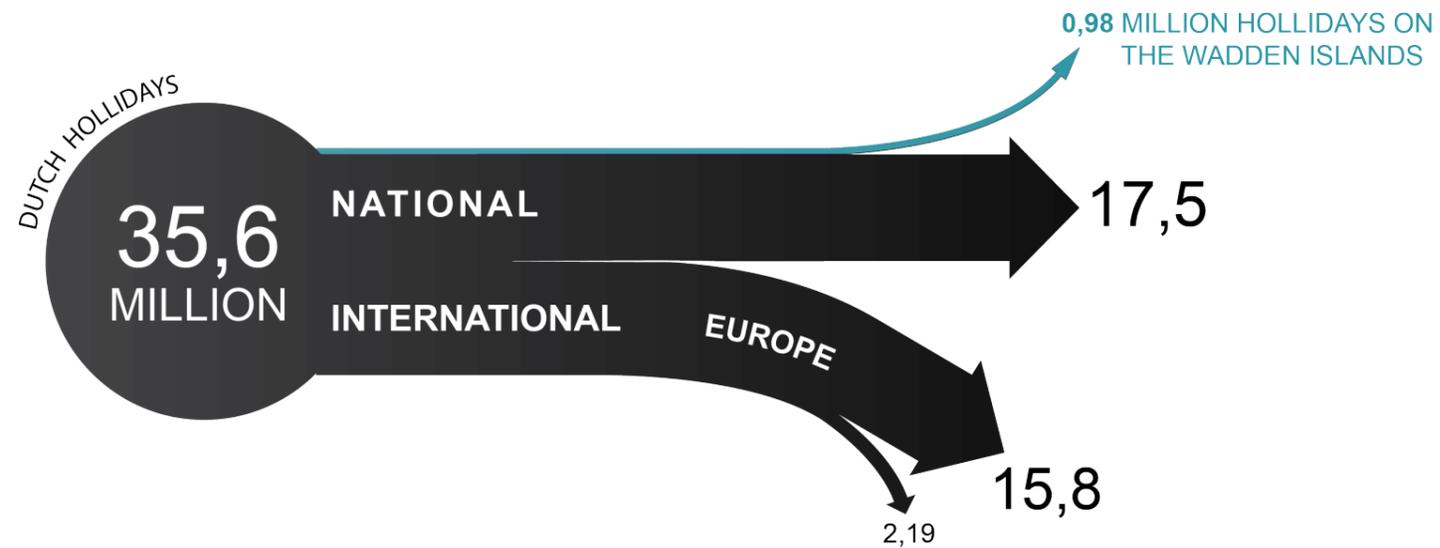


fig.8.1 | by NdG
 Nearly three percent of Dutch holidays is spent on the Waddenislands, about a third of that on Ameland
 source: Toerisme 2014, CBS, 2014

TOURISTS TO THE RESCUE CAN NATURE BENEFIT FROM THE EVER GROWING FLOW OF VISITORS, OR WILL IT PERISH

By Tim Bolleboom + Nafthaly de Graaf + Joost van der Zanden

Annually more than half a million people visit Ameland. Tourism has been growing to become one of the main economic activities. Contributing to the viability of the island and its inhabitants, but at the same time putting tremendous pressure on the landscape. Not by tourism itself, but by the instruments of accomodation, mindlesley deposited in the landscape.

The history chapter, earlier in this rapport, showed us the start of an ever accelerating growth of tourism in the middle of last century. However, the first signs of tourism are much older. As early as 1851 there has been an effort to make the beaches of Ameland profitable by realizing a bathing complex [8.1 en 8.2]. Driven by the quest for a new economic support for the island. With the disappearance of whaling, the main source of income for Ameland disappeared as well. The barren grounds (see soil and subsoil) prevented the inhabitants of Ameland from developing a strong and profitable farming culture. Key to the problem lay in tourism. Ahead of mass tourism that emerged in the 60s we see a turnaround in the labor

force on Ameland [fig.8.2]. Since that time the isle has evolved as a popular holiday destination while the population has remained stable. This has led to an unreal ratio that has no equal anywhere in the world. For every Amelander 142 visitors come to the island anually. It leaves all the other popular and populated holiday destinations far behind [fig. 8.3].

Over 70 percent of the visitors are originating from the Netherlands, the vast majority of the foreign presence is of German nationality, nearly 30 percent, with the remainder comprised of other nationalities from within and outside Europe [8.3].

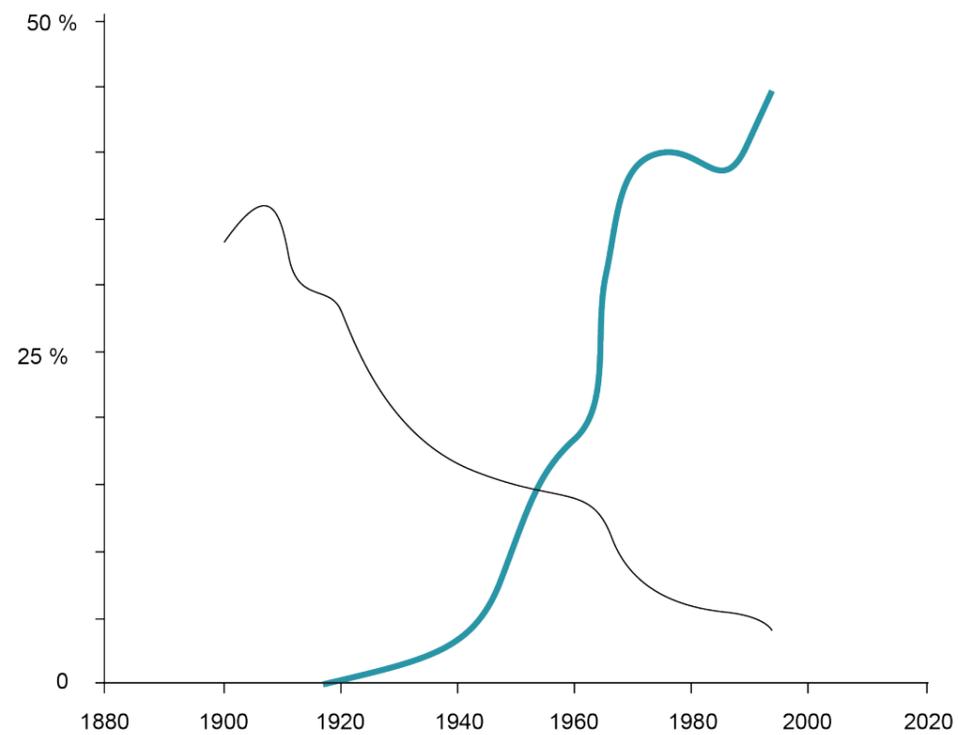


fig.8.2 | by NdG
 The islands economical shift clearly shows in the distribution of labor force per sector
 source: *Recreatie en Toerisme in het Waddengebied*, F Sijtsma & G Werner, 2008

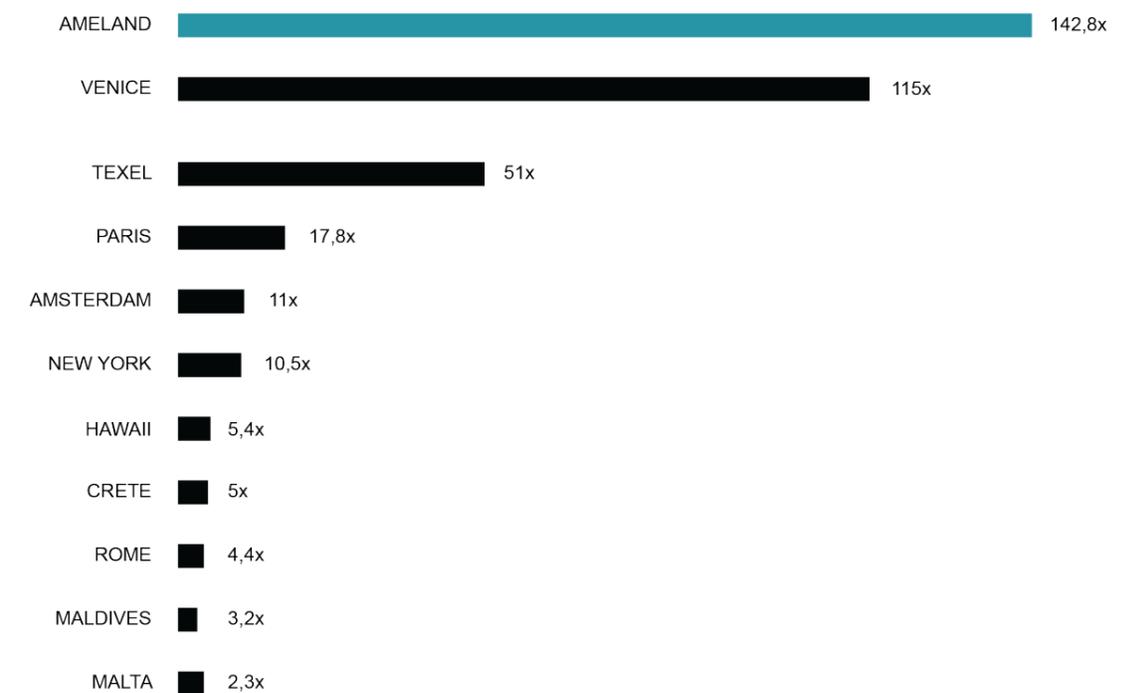


fig.8.3 | by NdG
 Ameland is topping the charts regarding the yearly visitor to residents ratio compared to other popular destinations
 source: *Wikipedia*

- 8.1 | *Zeebad-inrigting te Nes op Ameland*, *Leeuwarder Courant*, 1853,
- 8.2 | *De historische ontwikkeling van het toerisme op de Nederlandse Waddeneilanden in relatie tot de identiteit van het gebied, 1850 – 1990*, M ter Beek, 2012,
- 8.3 | *Toeristisch Actieplan Ameland*, van Hooff & de Bruin, 2005, 118, data from survey by Staatsbosbeheer, 2003

Over 70 percent of the visitors are originating from the Netherlands, the vast majority of the foreign presence is of German nationality, nearly 30 percent, with the remainder comprised of other nationalities from within and outside Europe.

Tourism in the Netherlands can be divided into seven categories according to research rapport Destination Holland [8.4]. Arguably three of the seven categories are applicable to Ameland, viz “Holland Beach Life”, “Holland Country Fun” and “Holland the Good Life”. The latter seen as dormant potential market, virtually unexploited.

To add more depth to the cross-section of visitors of the island we combine the results of various surveys to these categories [fig 8.7].

Annually, a strong peak in visitor numbers can be observed in the warm summer- and late summer months [fig 8.4, 8.6] for most young couples, families and youth groups. Remarkable is the high turnout in fall and spring where 55+ make up a substantial part [fig 8.7].

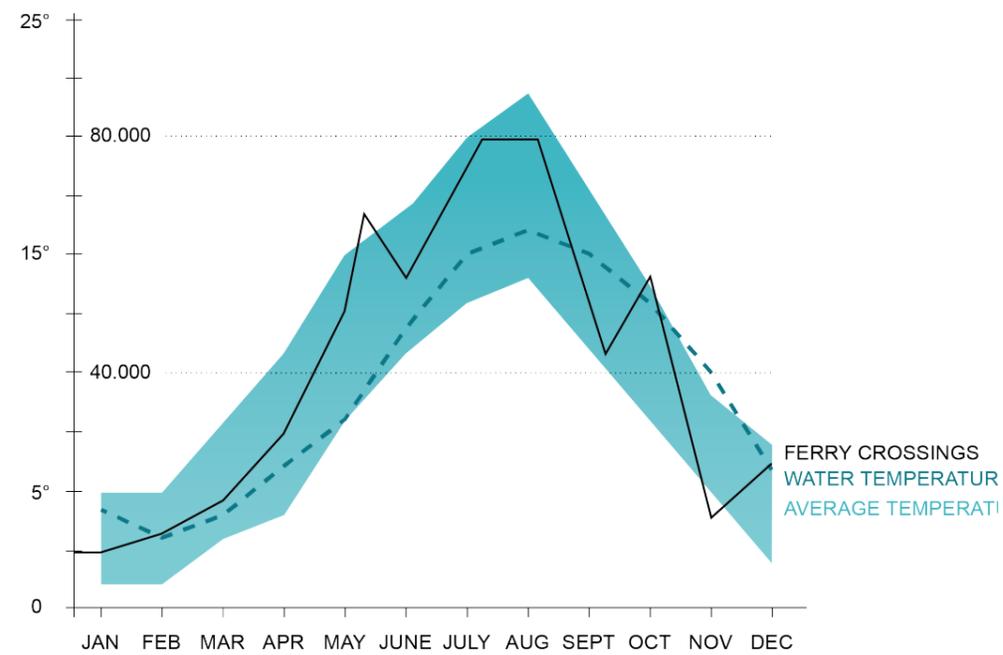


fig.8.4 | by NdG
As to expect, a strong correlation is noticeable between the weather and number of visitors
source: waddenweer (2015). Climate on Ameland. Retrieved on 20 October 2015 via <http://waddenweer.net>

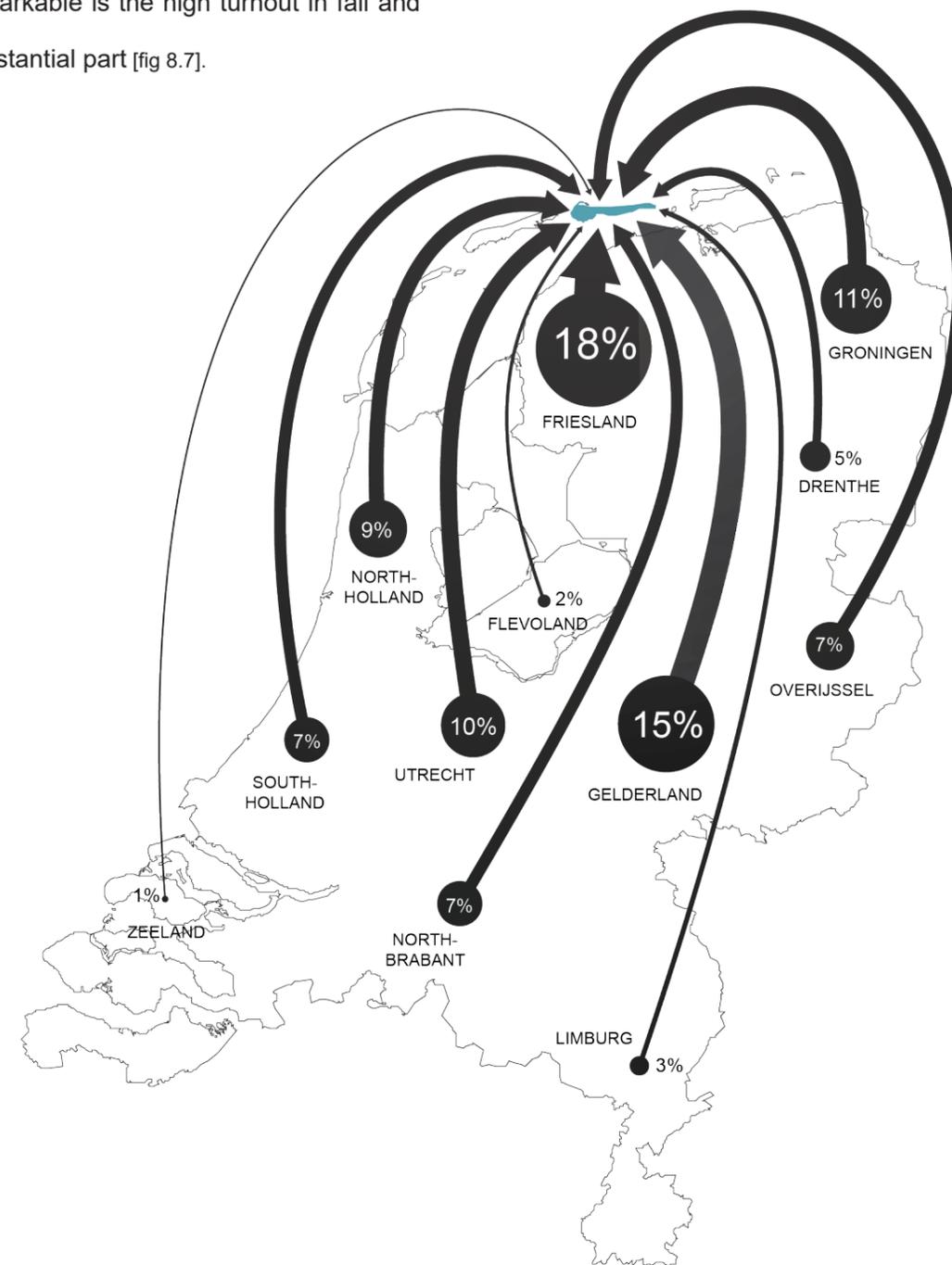


fig.8.5 | by NdG
Overview of origin Dutch share of visitors. Greater number in Friesland is explained by the numerous daytrippers from this province
source: Toeristisch Actieplan Ameland, W van Hoof & T. de Bruin, 2005



fig.8.6 | by NdG

On peak days in the summer, there are as much as 50.000 visitors on the island, versus 3.500 inhabitants

source: Toeristisch Actieplan Ameland, W van Hoof & T. de Bruin, 2005



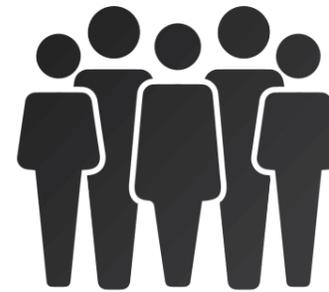
The happy couple / yuppies

Mostly visiting in peak season and to lesser extent in spring and fall. Motivations and activities within this group vary considerably. Eco tourism, recreational sports, beach going they are all represented within this group. Accommodation within affordable range from hotel to holiday home to campsite. As well as the older couples, this target group eats out quite a bit.



The Modern Family

Visits mainly in the summer months during peak season. Villas, holiday-houses or cabins are the most preferred accommodation for this group. Most families visiting Ameland come from all over the Netherlands, border regions of Germany and in significantly smaller amounts from Belgium. They are real beach lovers, like to take cycling tours across the different natural areas and visit a handful of musea. The vast majority of meals are prepared or consumed in the domestic realm of the rented home.



Groups, school- or sport related

With very few exceptions groups are made up of mostly teens and young adults. Ameland is a traditional destination for a lot of German schools from the border regions. Other groups are formed by healthy youngsters who come to the windy island for recreational sport activities. Groups are sometimes housed in special group accommodations or they settle in affordable holiday homes or a campsite. Some meals are provided by the groups themselves, others eat out. The older group members are often found enjoying a drink in one of the many taverns.



Retirees

Spring and fall seem to be the favourite months of the (nearly) retired group of Ameland visitors. It are these less warm months which provide them with a unique experience of the natural qualities of the Wadden. E-bikes have enlarged their action radius and leaves more energy for much appreciated hikes. This group is widely spread among the different types of accommodations. From an occasional villa, to hotels, to holiday homes to even the single typical Dutch campsite Ameland has to offer. This group of mainly couples provide their own meals as well as eating out.

fig.8.7 | by NdG

Compiled from various surveys

source: Recreatie en Toerisme in het Waddengebied, Raad voor de Wadden, 2008

Consumentenonderzoek Toerisme, M de Haas & P.H. Huig, 2010

The tourists produce a revenue of 110 million euro a year. A day tripper spends 18.50 euro a day and a long stay tourists 30.00 euro a day. On Ameland, yearly 1.9 million overnights take place. The largest part stays on a camping, followed by staying in a recreation dwelling. This is also noticeable and visible on the island: historical village are surrounded by an unilateral typology of recreation dwelling. These holiday villages are built as close to the touristic hotspots as possible. This damages the image of the historical places. Because of this, the small-scale character of Ameland is seriously challenged. The villages has not only to deal with the recreation dwellings, there are also arising more luxury holiday villas. The nature should make way for the tourism [8.4].

REAL ESTATE OF RECREATION

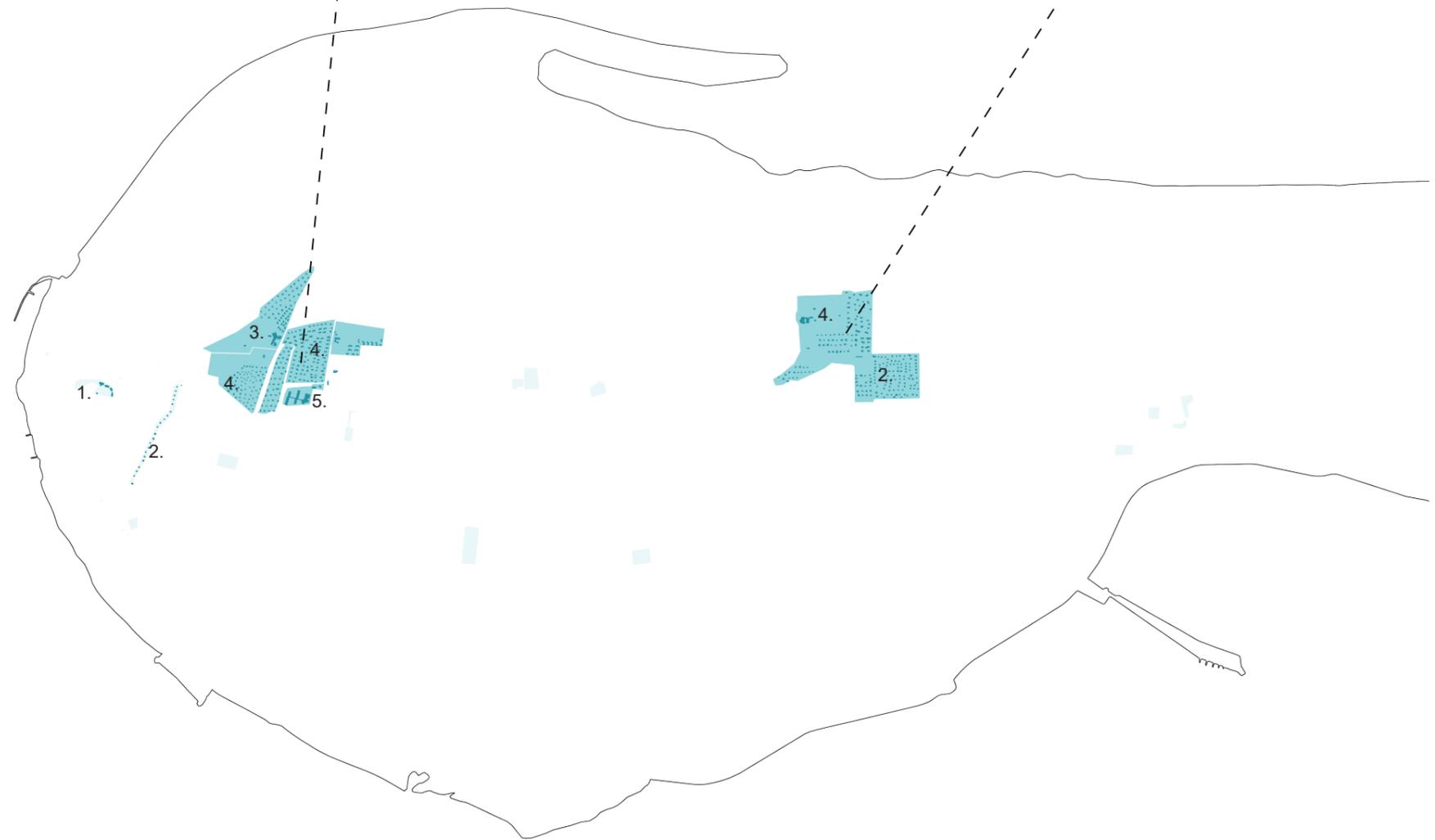
North of each village on Ameland there are several holiday districts. Together they contain $\frac{3}{4}$ of the total real estates in the recreation sector [appendix 2]. The bungalow districts seem to be in possession of a collective ownership which is actually not true. Some districts are set up by private persons or big investors, but sold to the private sector. Because of this, many employers let it out for hire to stay the night. This makes that each share of every employer individually, is very small compared to the total. Also bigger organizations like Landal, Fletcher, WestCord and Stayokay only possess small complexes which makes their share in the total of the recreation economy of Ameland, again very small. The biggest holiday district is Boomhiemke, they possess 7% of the total real estates in the recreation sector [appendix 2]. Since the foundation it was property of Ameland employers, but since 2014 it belongs to the organization Roompot. Making a conclusion we can say that the real estates on Ameland mainly belong to Ameland employers and private persons. Only a small share belongs to big organizations. The consequences of this are that the main part of the economic sector is for the better of the island.



The middle segment tourist can find a variety of bungalows at holiday park the Blieke. These bungalows are standard vacation homes and have no relation with Ameland and its landscape. This is strengthened by the high vegetation around the park.

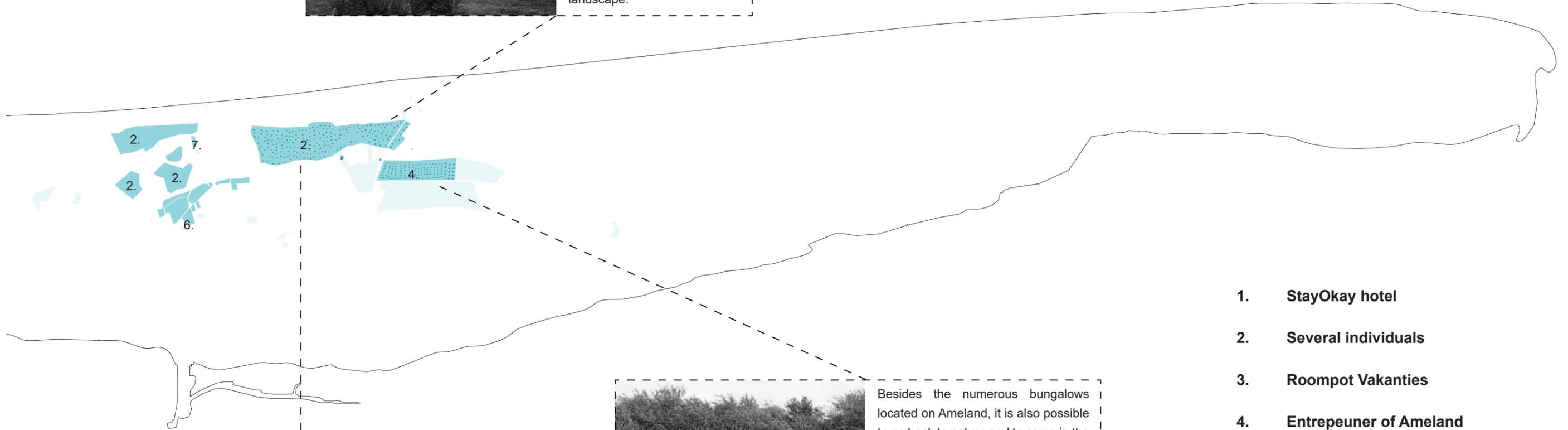


Besides the bungalows and villas on Ameland that aim for the tourist with a large budget, the lower segment tourist can find mobile homes at campsite the Roosendunen. These mobile homes stand close together on eight hectares of dunes.





The bungalow is built in the style of a rustic Ameland farm. This bungalow is suitable for the group in the medium-high segment. They are situated next to each other in the dunes of Ameland and dominate the landscape.



The prosperous tourist can find various holiday villas in the dunes of Buren. These villas are fully equipped and dominate the natural landscape with their thatched roofs. In this way the connection with the dunes is lost. The villas are a disruptive factor in the landscape.



Besides the numerous bungalows located on Ameland, it is also possible to go back to nature and to camp in the nature of Ameland. At the campsites there is room for various kinds of tents, caravans and campervans. This form of recreation fits with the lower segment tourist.

- 1. StayOkay hotel
- 2. Several individuals
- 3. Roompot Vakanties
- 4. Entrepeneur of Ameland
- 5. Fletcher Hotels
- 6. WestCord hotels
- 7. Landal GreenParks

fig.8.8 | by TB + JvdZ

The different typologies of holiday homes on Ameland

Source: VVV Ameland (2015). overnachtingen. Retrieved on 22 October 2015 via www.vvvameland.nl/overnachten

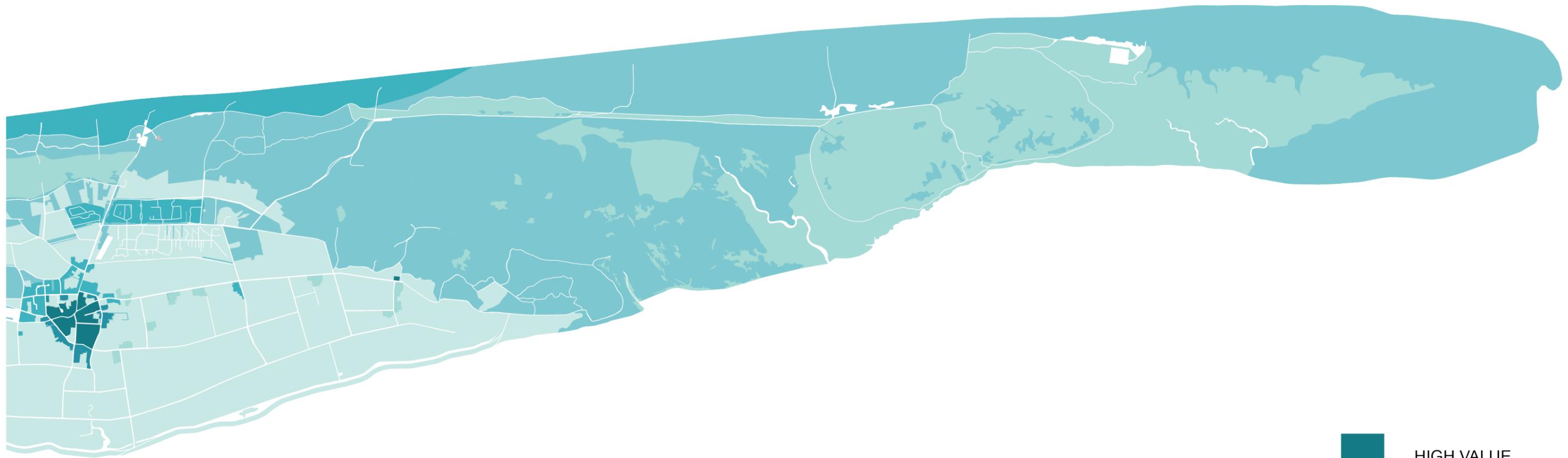
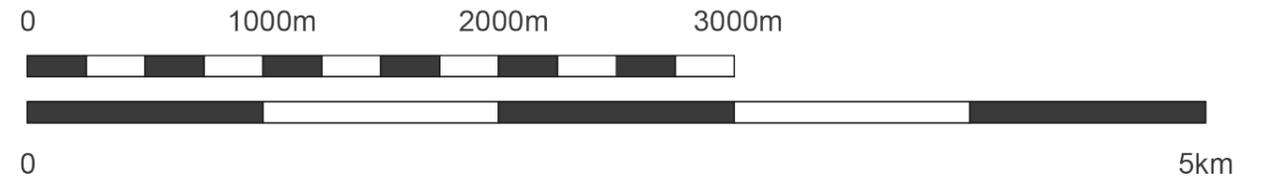


fig.8.9 | by TB

Value map of cultural tourism

source: VVV Ameland (2015). Kaart van Ameland. Retrieved on 3 October 2015 via www.vvvameland.nl/kaart-van-ameland

De Amelander (2015). Kaart van Ameland. Retrieved on 3 October 2015 via www.deamelander.nl/live/kaart-van-ameland



CULTURAL TOURISM

IMMACULATE ISLE

By Tim Bolleboom

In the previous chapter, various tourism target groups are described. Besides the various target groups, a distinction could be made in the different kinds of tourism that takes place on Ameland. The following three maps show each kind of tourism with the value of the different areas of Ameland.

The cultural tourism is mainly focused on the middle part of the island. Picturesque villages with characteristic commandeurswoningen are situated there. Besides the four villages, nature has an important value for the cultural tourist, the nature is an essential feature of Ameland. [8.4]

8.4 | Wikipedia (2013). Cultuurtoerisme. Retrieved on 3 oktober 2015 via <http://nl.wikipedia.org/wiki/Cultuurtoerisme>

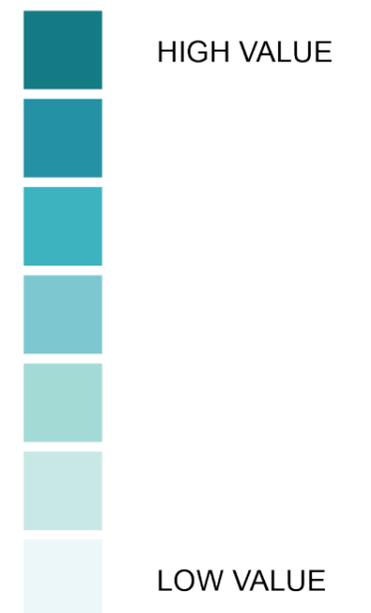
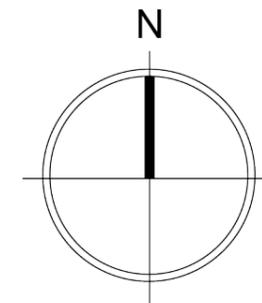




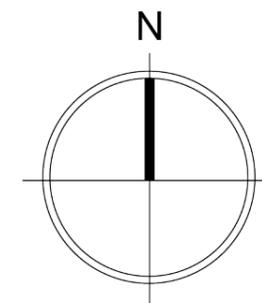
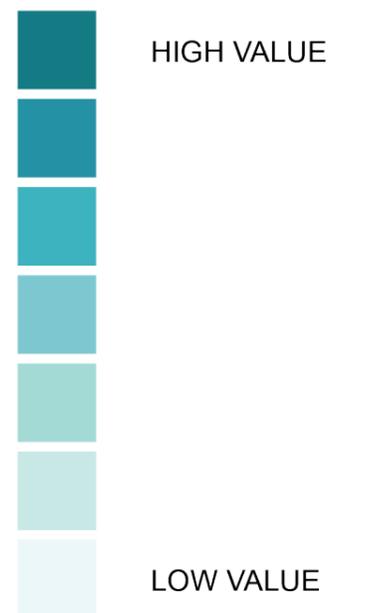
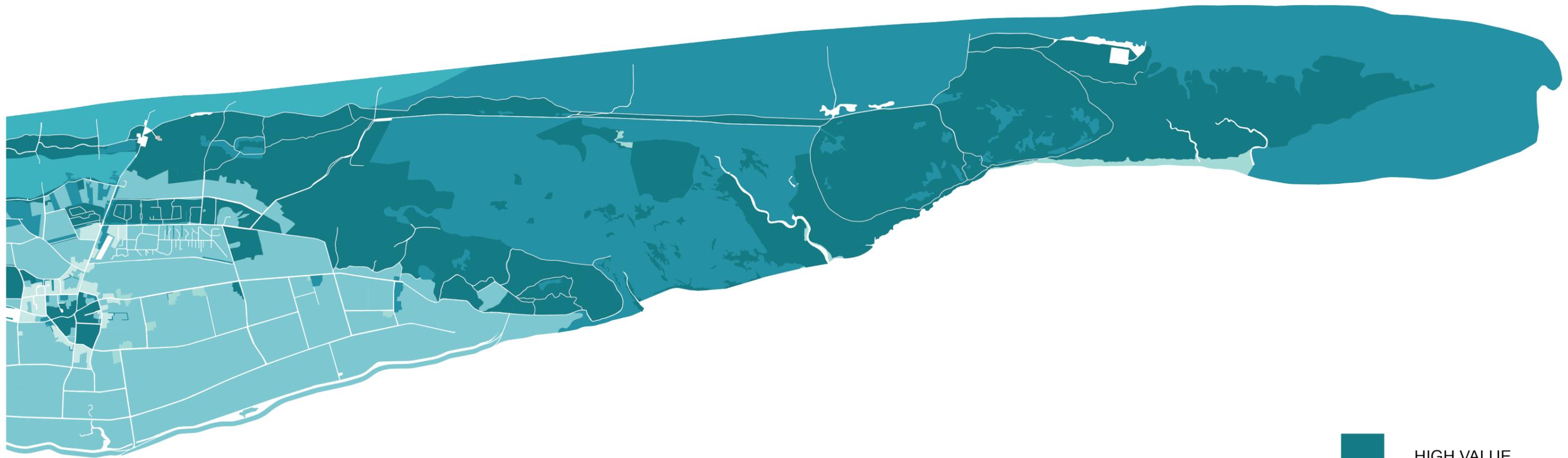
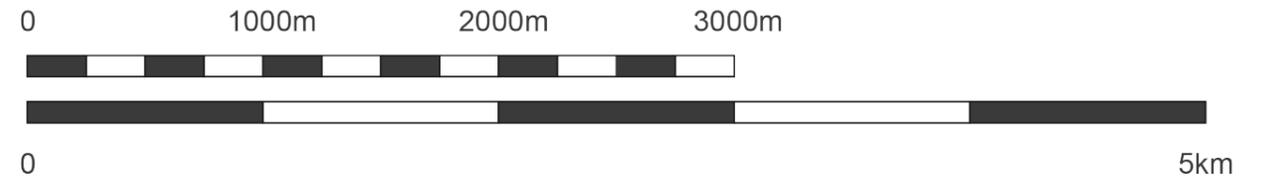
fig.8.10 | by TB

Value map of eco tourism

source: Persbureau Ameland (2009). Ameland gaat voor goud. Retrieved on 3 October 2015 via www.persbureau-ameland.nl/ameland-gaat-voor-goud

VVV Ameland (2015). Kaart van Ameland. Retrieved on 3 October 2015 via www.vvvaland.nl/kaart-van-ameland

De Amelander (2015). Kaart van Ameland. Retrieved on 3 October 2015 via www.deamelander.nl/live/kaart-van-ameland



ECOTOURISM

HOLIDAY AND SOCIAL RESPONSIBILITY

By Tim Bolleboom

Ecotourism is concentrated on socially responsible traveling, personal growth, and ecological sustainability. The eco-tourist travels to destinations where cultural heritage, flora and fauna are the main attractions. Ecotourism is maintained on giving tourists insight in the impact of the nature on the environment. [8.5]

The eco-tourist is searching for fragile, pristine, and relative undisturbed nature area. Ecotourism is concerned with small-scaled alternatives with a low impact on nature and acts a counterpart of mass tourism. The purpose of the journey is to gain knowledge and enjoying nature in all its facets. Furthermore, ecotourism helps to raise funds for ecological conservation. [8.6]

8.5 | *Fundamentals of Geotourism*, Sadry, 20009

8.6 | *Ecotourism and Sustainable Development: Who Owns Paradise?*, M. Honey, 2008



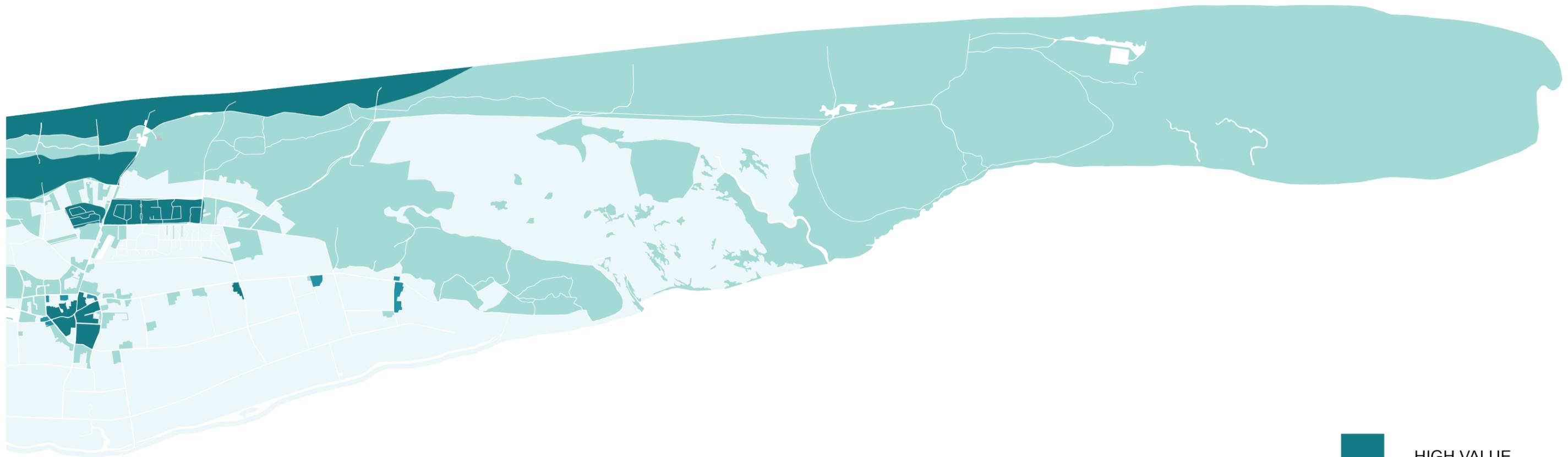
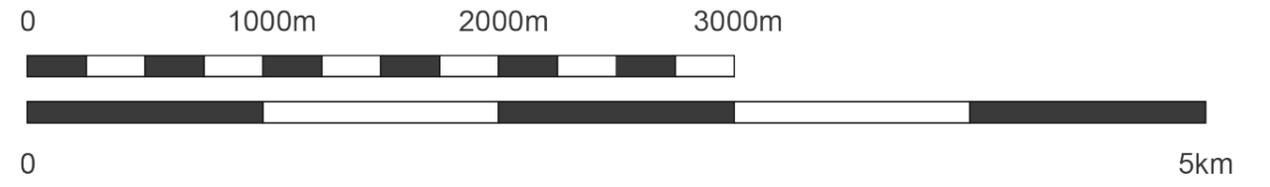
fig.8.11 | by TB

Value map of beach tourism

source: Ameland ...ander land : de complete reisgids, Jolanda de Kruyf en Roelof Tienkamp, 2008

VVV Ameland (2015). Kaart van Ameland. Retrieved on 3 October 2015 via www.vvameland.nl/kaart-van-ameland

De Amelander (2015). Kaart van Ameland. Retrieved on 3 October 2015 via www.deamelander.nl/live/kaart-van-ameland



BEACH TOURISM

CATCHING A FRESH AIR

By Tim Bolleboom

The beach tourist is visiting Ameland because of its coast. The preference is the North Sea coast, because there are many sandy beaches with a variety of beach establishments. [8.7]

This target group are mostly visiting Ameland for one single day. Furthermore, “the family” can also be found on the beach, as is described at the target groups. Besides going to the beach, the beach tourist also likes the sportive activities that can be done on Ameland. For this, there can be thought about cycling along the dunes, kite surfing, diving, and playing golf.

8.7 | Toeristisch Actieplan Ameland, W van Hoof & T. de Bruin, 2005

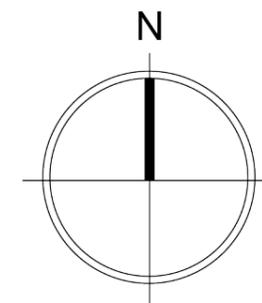
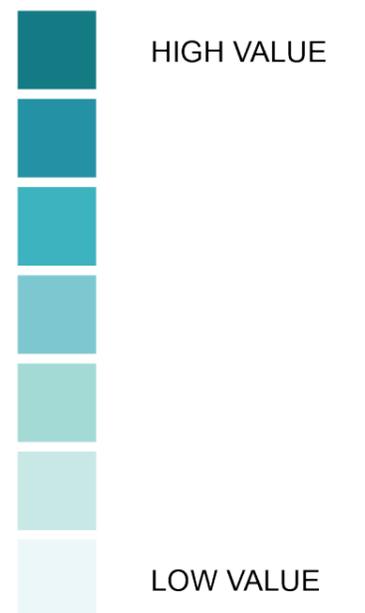
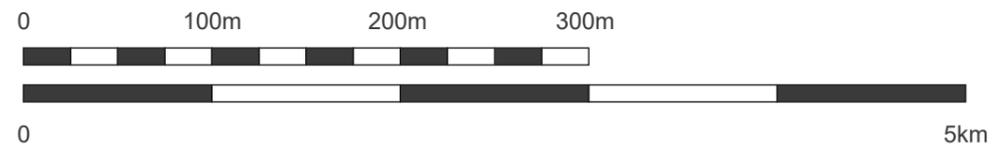
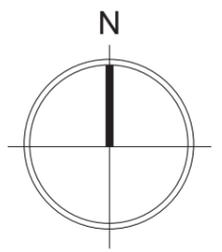




fig.9.1 | by RB
Map of local values



-  OVERLAP WITH TOURISTS
-  COMMUNITY BUILDING
-  WORKING
-  SPORT FACILITIES
-  DWELLING
-  CONNECTIONS



VALUEMAP LOCALS

WHAT ARE THE VALUES FOR THE LOCAL INHABITANTS?

By Roel Bekkers

From a local's perspective the most important values of the islands can be found around the cores of the villages; the houses, the connections and the agricultural land. In regard of employment facilities (offices, factories) there are little values to be found with the exception of a small industrial zone and a few offices nearby the entrance of the island. There are a variety of communal facilities like for instance; the town hall, a school, sport facilities, several bars, churches and community centers. Some of these facilities are being shared with the tourists. The spots are indicated on the map. Here, the important values for the local inhabitant and for the tourist overlap. For instance; the Clemens church is an import site where Christian inhabitants of Nes meet each week, at the same time the church attracts tourists because of its monumental value.

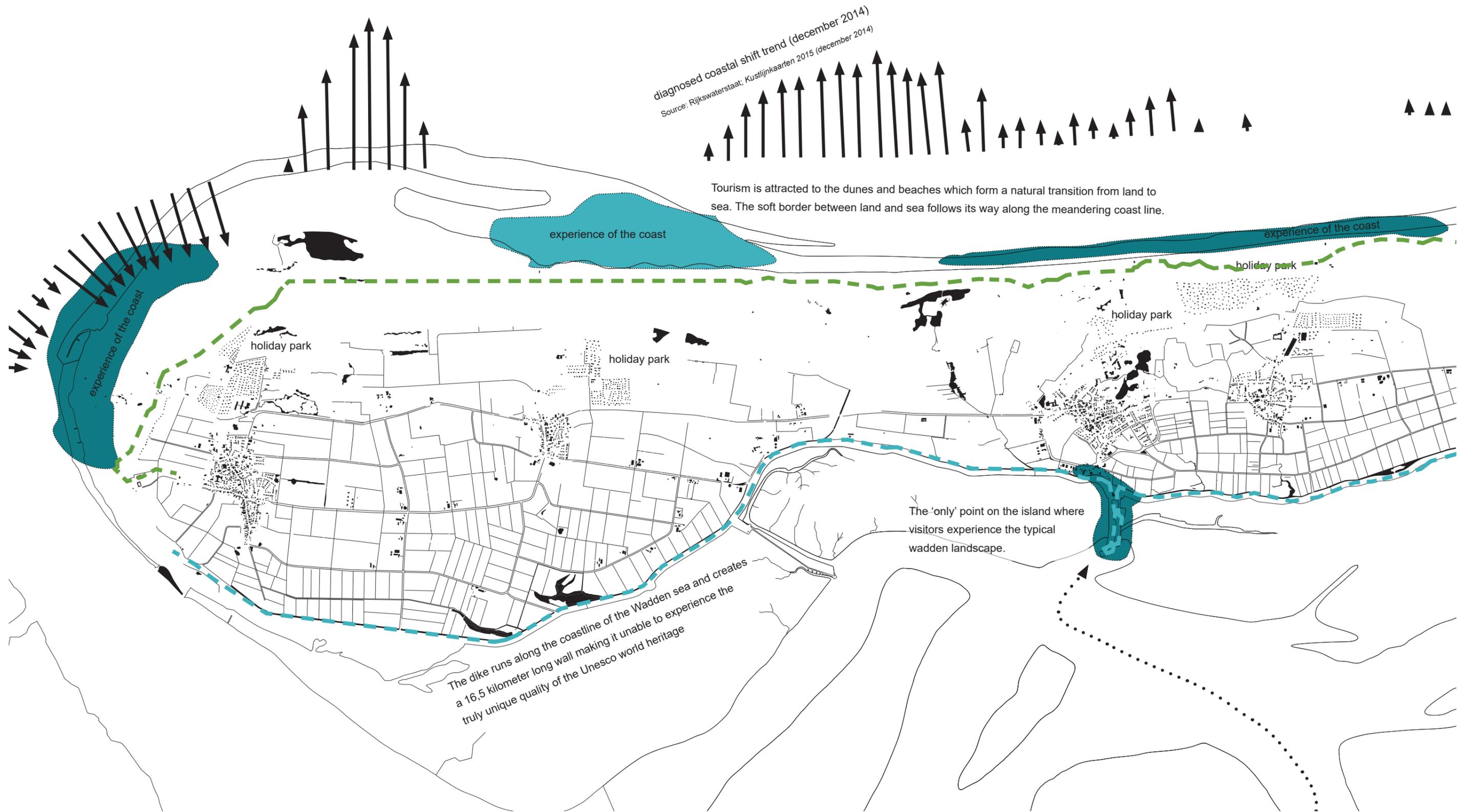
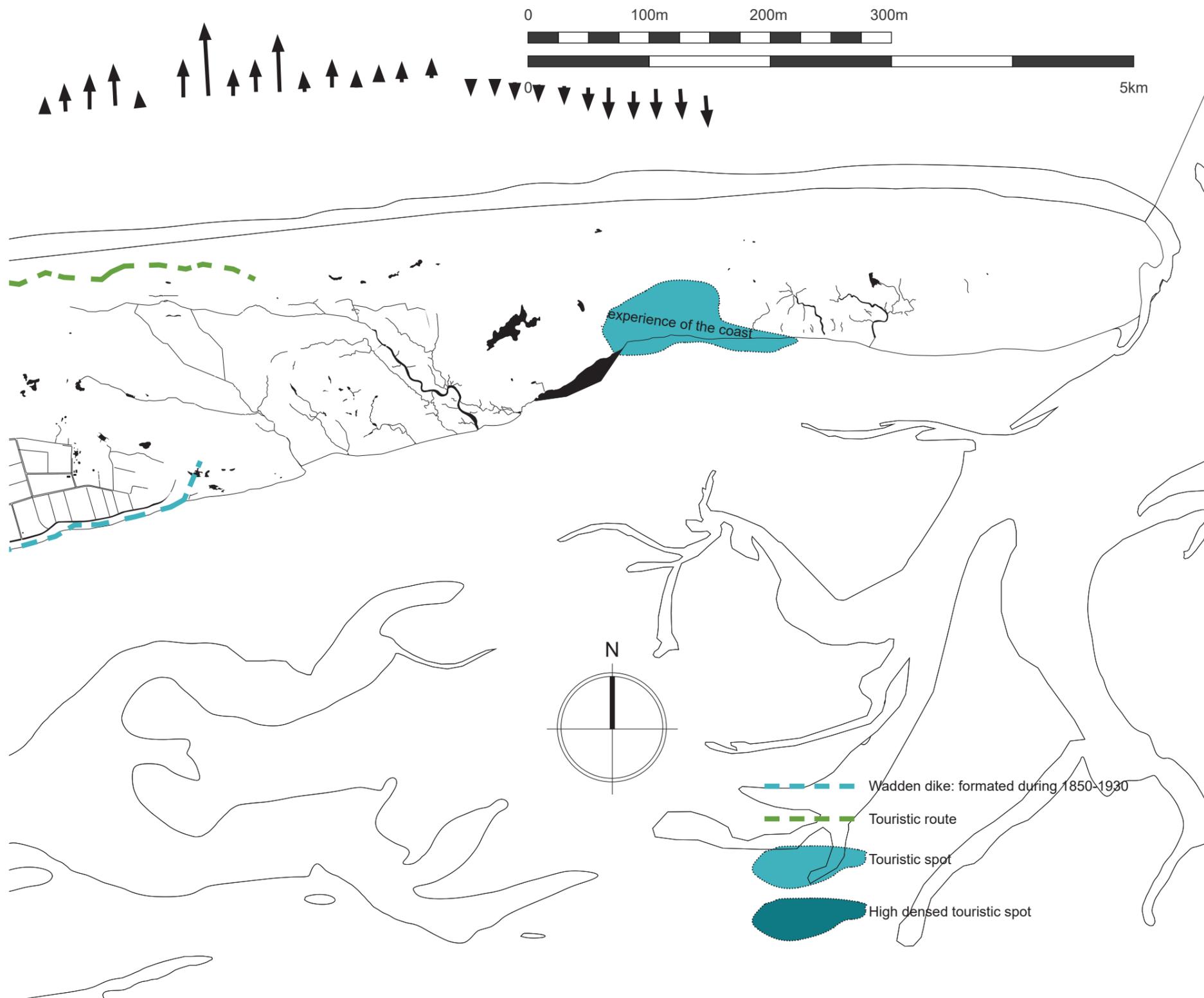


fig.10.1 | by RB
Values along Ameland's coast line
source: Kustlijinkaarten, Rijkswaterstaat, 2014



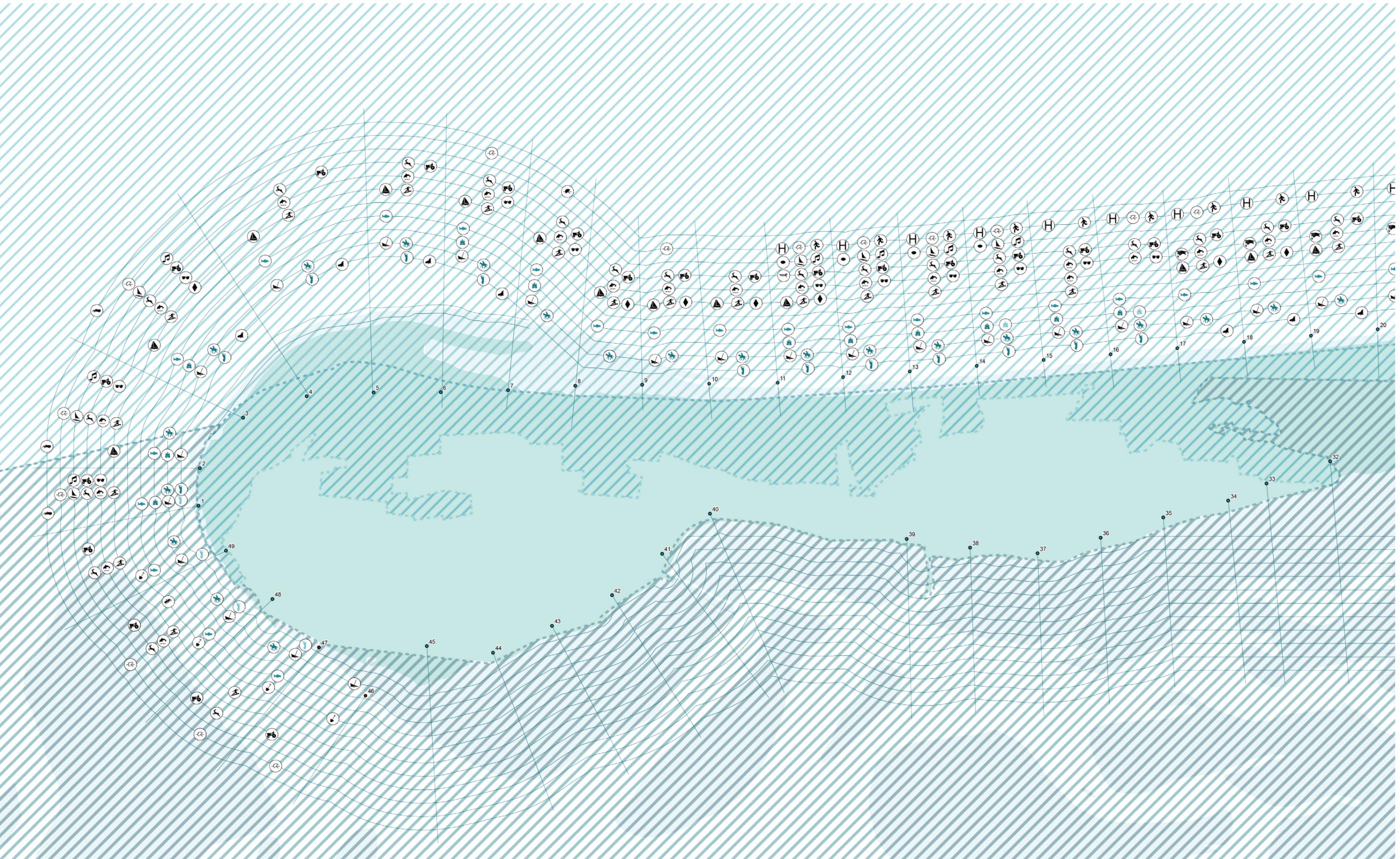
VALUEMAP COASTLINE

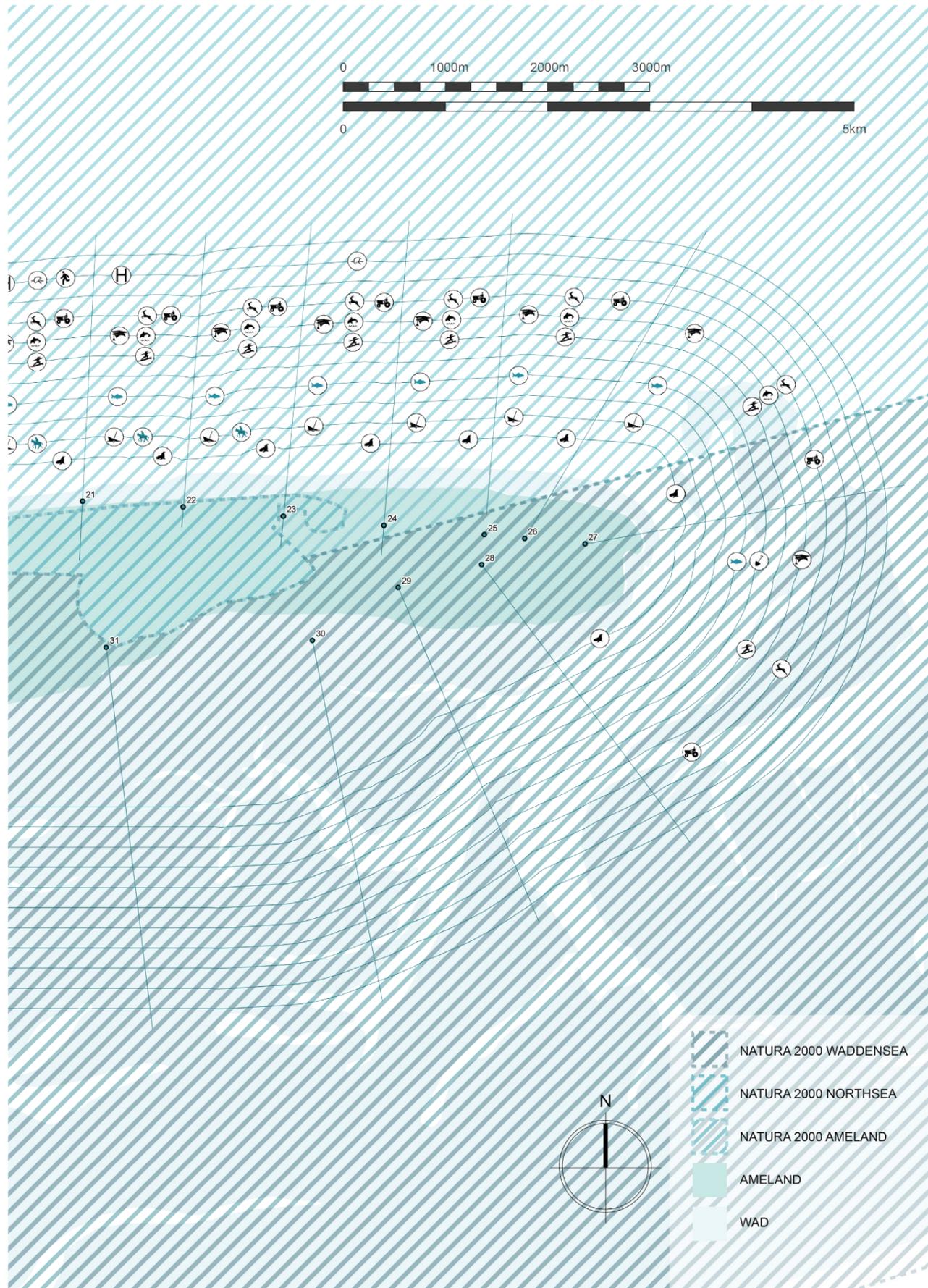
WHAT ARE THE VALUES OF THE AMELANDER COAST LINE?

By Roel Bekkers

When taking a closer look at Ameland's coast line in regard to tourism, it becomes clear that the most interesting sites for tourism are located at the north side of the island. Here there are dunes and beaches which form a natural transition from land to sea. The soft border between land and sea follows its way along the coast line. Tourism prospers on the unique natural qualities of the island. On the other hand, this kind of dunes and beaches are not truly unique and not really different compared to the rest of the Dutch coast line. One might expect to experience the distinctive and truly unique landscape of the Wadden sea except this view of blocked by the Wadden dike.

The dike runs along the coastline of the Wadden sea and creates a 16,5 kilometer long wall making it unable to experience the truly unique quality of the place, the Wadden sea. To make matters worse, the Wadden dike is all there is to see when approaching the island. The island seems to turn his back to the most unique asset it has, the Unesco world heritage of the Wadden sea.





PROTECTING AMELAND NATURA 2000

By Tim Bolleboom

The first question that rises is what is Natura 2000? The European Union has a system to protect the irreplaceable nature overall in Europe. This protection is focused on characteristic nature in Europa: landscapes, vegetables, and animals.

Op Ameland, there are three Natura 2000 areas: North Sea coastal zone, Wadden Sea, and dunes Ameland. The indication of a large part of Ameland as Natura 2000 area is a recognition of the exceptional value of the area. However, this means not that nothing will happen in the area. On the map [fig 11.1], all activities in the Natura 2000 area are represented [11.1].

11.1 | Ontwerp Natura 2000 Beheerplan Ameland, Periode 2016-2022, Jan Meijer, Gabriël Vriens, Sies Krap & Evert Jan Lammerts, 2015

ACTIVITIES WITHIN NATURA 2000

- excursion (apr t/m oct)
- excursion (throughout the year)
- ecological research
- beachcombing
- riders
- campfire (summer season)
- Easter fire
- fish activities (in general)
- piers stabbing
- catamaran
- beach sailing
- wind and wave surfing
- beach sports (Kitesurfing)
- education (all year)
- First Aid whale strandings
- lifeguards
- assistance (Jetski)
- driving route wildlife management
- car / tractor (rides)
- beach maintenance (heavy equipment)
- festival rugby / volleyball tournament
- festival: surf festival Madnes
- Festival: POP Ameland
- catering on the beach
- beach sports / recreation
- running events (Triathlon)

fig.11.1 | by TB

source: *Activiteiten in Natura 2000-gebieden Ameland, Topografische Dienst Kadaster, 2009*
Ontwerp Natura 2000 Beheerplan Ameland, Periode 2016-2022, Jan Meijer, Gabriël Vriens, Sies Krap & Evert Jan Lammerts, 2015

WAD'S NEXT ?



SCENARIOS

THE HIDDEN POTENTIAL OF DYNAMIFICATION

By Tim Bolleboom + Robert Lancel

Artificial preservation of the coastline in the last century has led to a static landscape. The synergy between the natural and urban systems has been lost. Reintroducing dynamics will lead to a landscape with vast economic potential for recreation. Large scale dynamic coastal management can create opportunities for new development and add value along the coast of Ameland.

Seven different scenarios illustrate a wide range of opportunities for the future development of Ameland. When looking at the potential of the sea, it becomes clear that reconnecting the natural and urban systems of the island is the only option to keep up with the ever increasing number of tourists. Utilizing the hidden potential of dynamification will preserve the historic values while tourism expands.

Super Beach:

By depositing silt and sand, Ameland and her beaches are naturally extended gradually at the north side. The new beach is established with natural lagoons that heat faster than the seawater whereby the beach season is extended to the pre-season and the late season. This results in significantly more beach tourists at Ameland. This encourages the economy of the island and the local entrepreneurs.

Floodplains:

Due to divers breakthroughs in the wad dike, a dynamic landscape had arisen behind the dike. A diverse landscape where a variety of flora and fauna can develop, is created. This new landscape can become a connection between Ameland and the Wadden Sea, which is missing until now. The floodplains is getting off the dynamic coastal management. This new landscape attracts tourists that appreciate and want to experience the nature and the unique characteristics of the island.

High Density:

The current Ameland stays maintained and the tourism will not be expended furthermore. In this way, the natural and cultural values of the island are protected. Contrasting to Ameland, a new island with a high population density and a focus on mass tourism is created. Here there are high-quality accommodations, recreational utilities and conference centres, so that the high net target group will be attracted to the island. This sector anticipates on the scarcity of time and the need of comfort at the prosperous consumer.

Natural Bay:

Natural accretion of sand and silt on the tidal flats have led to the formation of a natural island. The tides provide a lasting supply of sand and silt have created a natural bay. The expansion of Ameland outside its southern levees have led to a new landscape which has a direct relationship with the Wadden Sea. The natural qualities of the bay and its improved accessibility through new watersheds attracts recreational boating and enhances the appeal of the island.

Insomnia:

Ameland has aimed for the intensification of tourism. No longer the "older" tourist is the main target. The new tourist finds 24/7 entertainment in a vibrant nightlife. The island has clearly divided into different zones. The North Sea coast is heavily used by daytime tourism. At night the "verbindingsweg" is the place to be. The existing villages are an integral part of the recreation strip. Restaurants, theaters and nightclubs attract a new public and provide a huge cash flow and employment to the Amelanders.

A-Me-Land:

Dynamic coastal management have led to a literal splitting of the island. For Nes and Buren tourism has not changed. Day trippers still visit the two villages despite the island lost 2/3rds of its surface. The Oerd, Nes and Buren lost the connection to the ferry. The Oerd now has a flourishing nature as a result of the significant reduction in the human influence. A limited number of visitors are monthly allowed to visit the Oerd. Hollum and Ballum are permanently split from the two conservative villages and are with water sports and aviation entirely focused on the active tourist.

The Artificial Archipelago:

In the Wad area, a couple of new island are created. Each island focus on a specific target group, like sportsman, people that want to go out, beachgoers, and the prosperous consumer. Due to specific target groups, there are islands created with unique characteristics and optimal conditions for the group in question. The entrepreneurs of Ameland can also economically benefit from this, by creating new accommodations and catering industries that are concentrated on the new target groups.

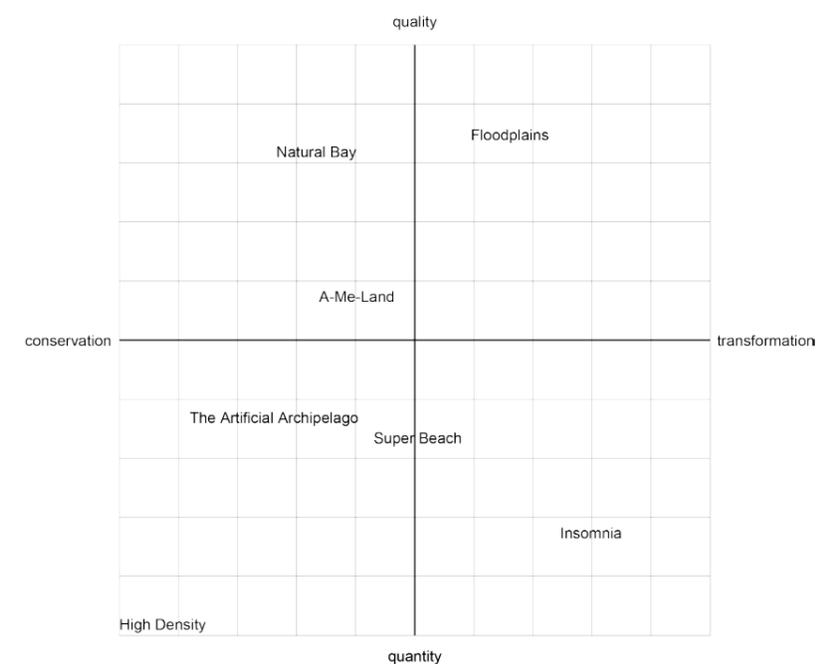


fig.12.1 | RL
Scenario spectrum, visualizes scenario qualities within its context.

This spectrum [fig 12.1] includes two axis, vertical quality versus quantity and horizontal conservation versus transformation. In the various scenarios the term quality indicates the spending per tourist. Spending per tourist is a certain measure of quality. Quantity is about the number of visitors to the island. So it may be that there are less tourists coming but they spend more (quality) such as in the scenario Floodplains. However, it is also possible that the focus lies on attract as many tourists to the island (quantity) as shown by Insomnia.

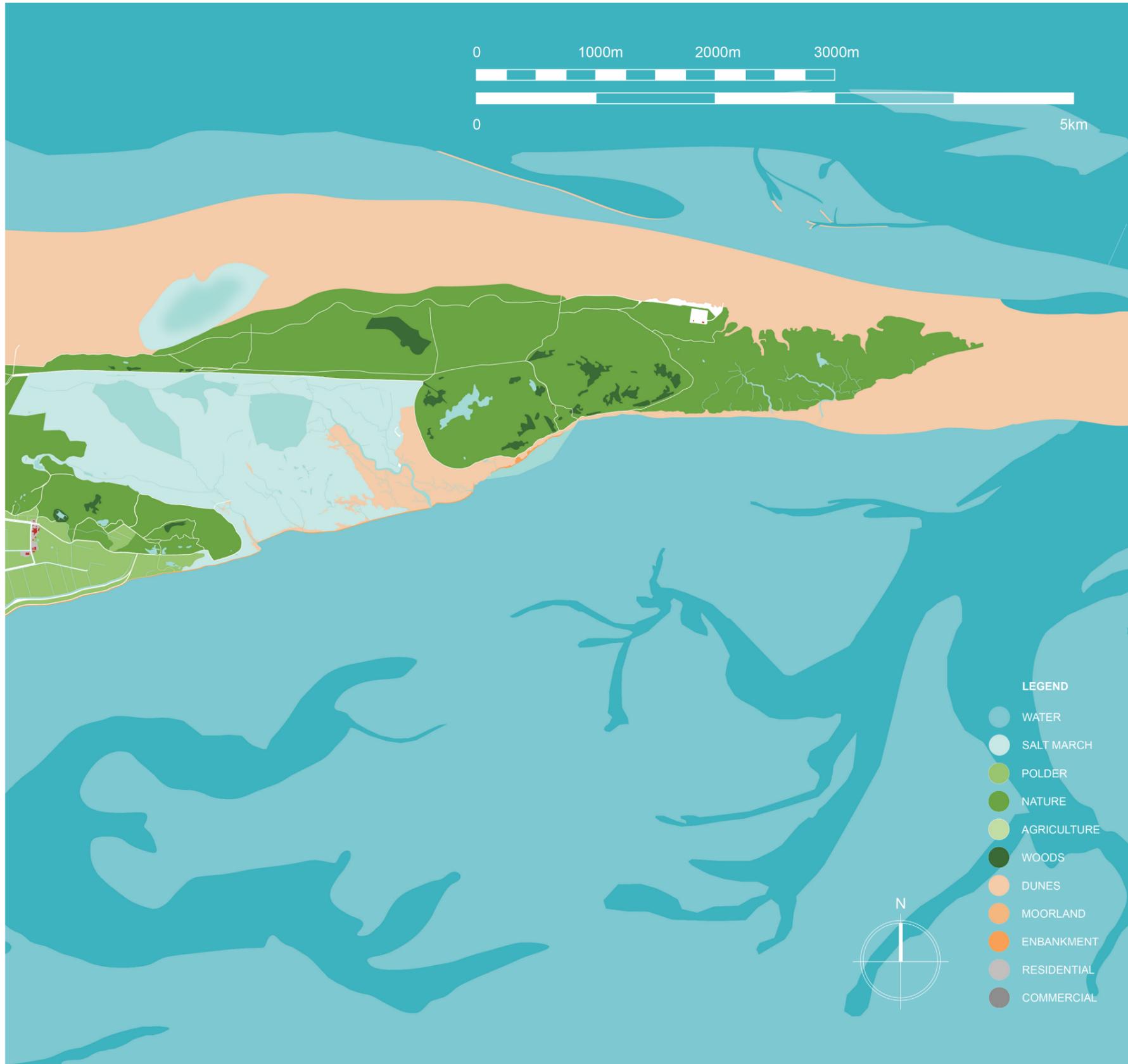
The second axis focuses on the adjustment of the island. Conservation aims on maintaining Ameland as it is. Opposed to this we have transformation whereby alterations to the island are being made to achieve the goal.

SUPER BEACH

THE DUTCH ZANZIBAR

By Tim Bolleboom



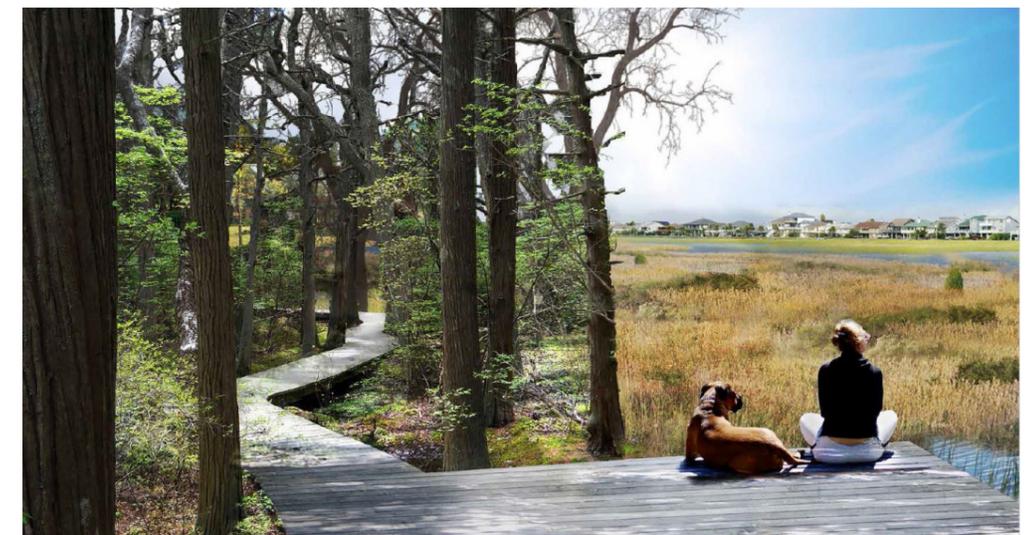


FLOODPLAINS

HIGH WATER HIGHER GROUND

By Tim Bolleboom

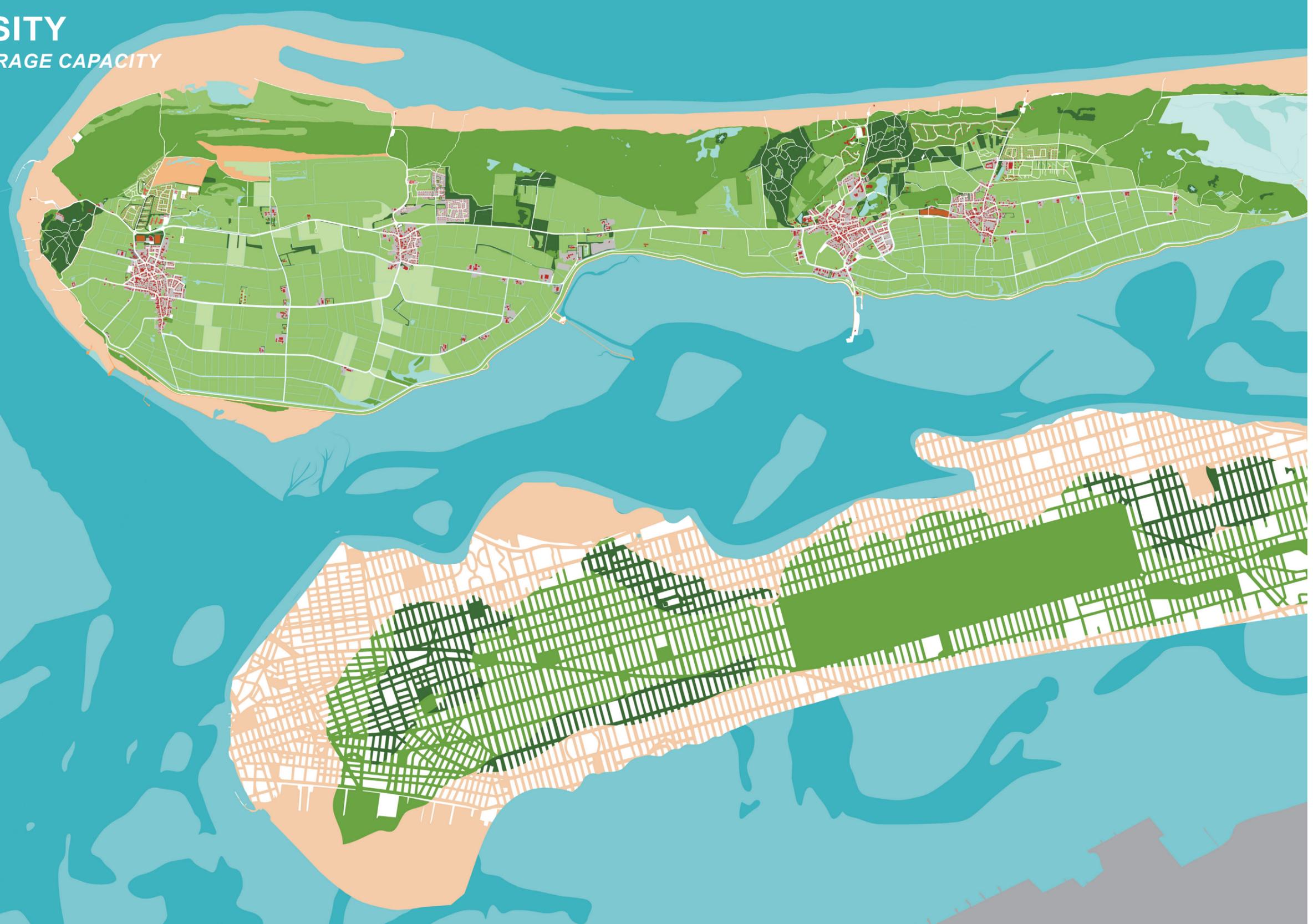




HIGH DENSITY

INCREASING STORAGE CAPACITY

By Tim Bolleboom





NATURAL BAY

EMBRACING THE WADS

By Robbert Lancel





INSOMNIA

THE CITY THAT NEVER SLEEPS

By Robbert Lancel



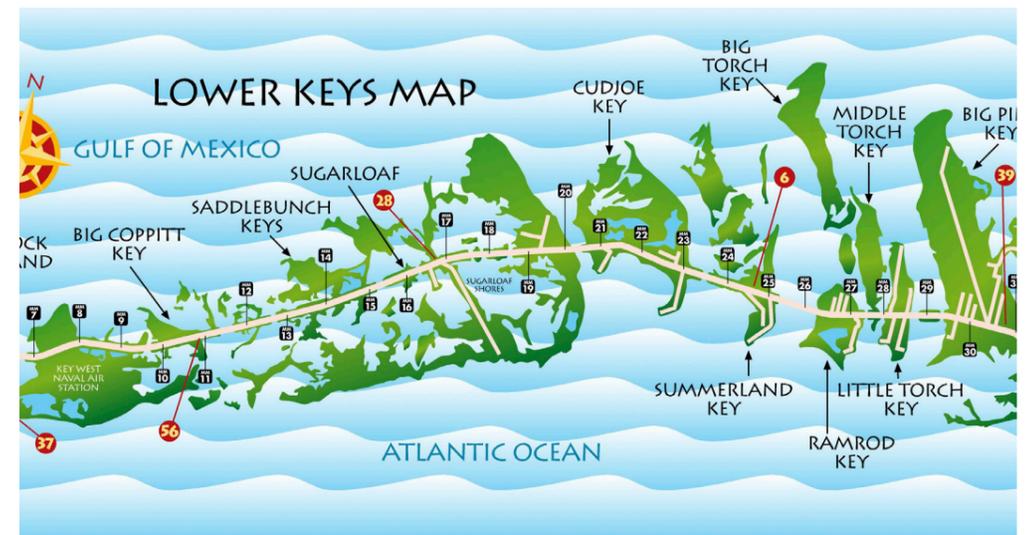


A-ME-LAND

THE NORTH SEA RECLAIMS

By Robbert Lancel





THE ARTIFICIAL ARCHIPELAGO

COLONIZING THE CULTURAL HERITAGE

By Tim Bolleboom





CONCLUSION

One of today's dilemmas of Ameland is the tension between recreation and mass tourism pressure on nature and the historic values of the island. By generating 110 million euro a year the main economic engine of the island is tourism, which comes at a price. Historical villages are surrounded by an unilateral typology of recreation dwelling and luxury holiday villas. [13.1]

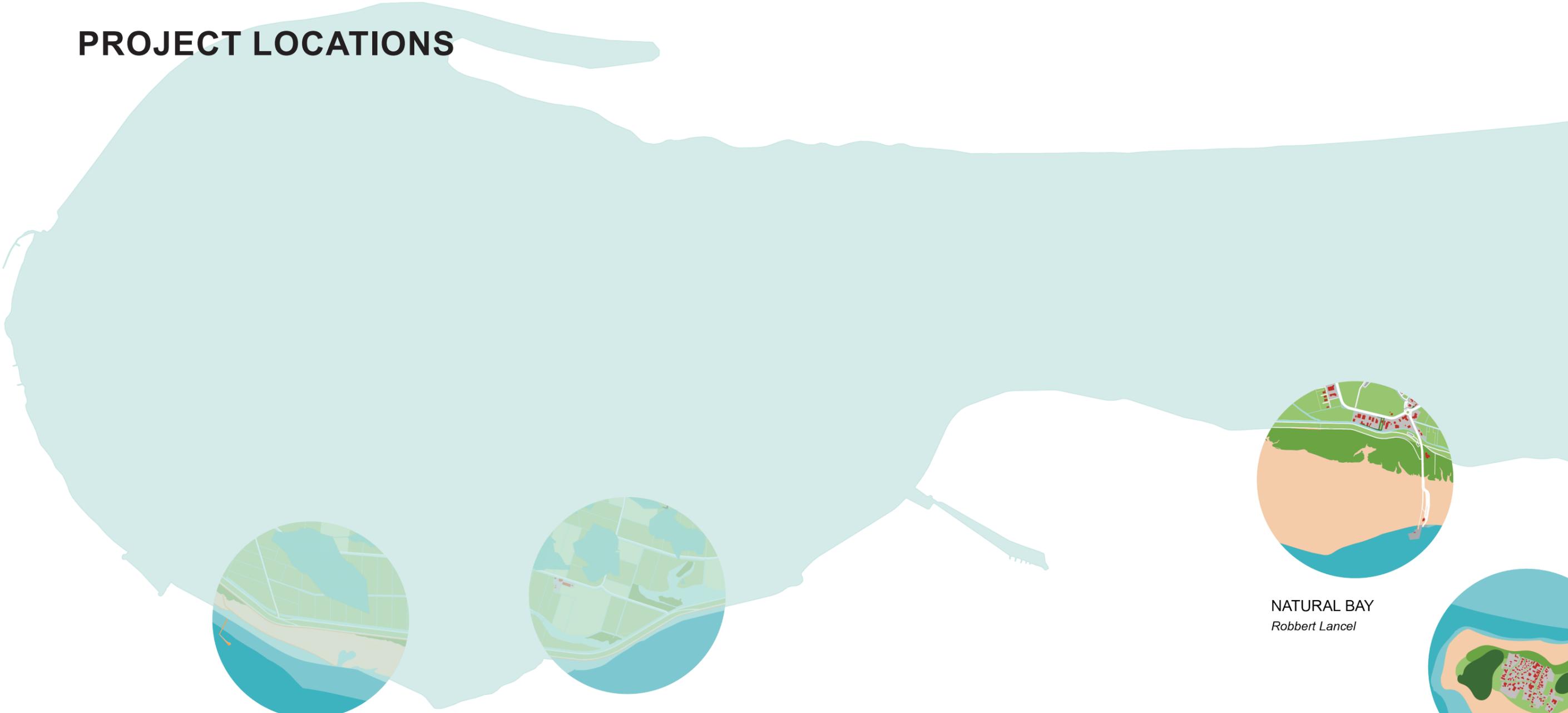
When looking at the potential of both the sea and the island itself, it becomes clear that reconnecting the natural and urban systems of the island is the only option to keep up with the ever increasing number of tourists. Utilizing the hidden potential of dynamification will preserve the historic and natural values while tourism expands. The seven scenarios illustrate a wide range of opportunities for the future development of Ameland. The scenarios reintroduce dynamics to the island, on the one hand by changes made on the island, on the other hand by changes deployed through dynamic coastal management in order to achieve the set goal. The last one has the widest support among stakeholders. [13.3] Dynamic coastal management is economically viable in the long term compared to artificial preservation of the coastline. Also the biodiversity and the ecosystem benefit which can lead to new forms of tourism [13.4]

13.1 | Chapter 8, tourists to the rescue

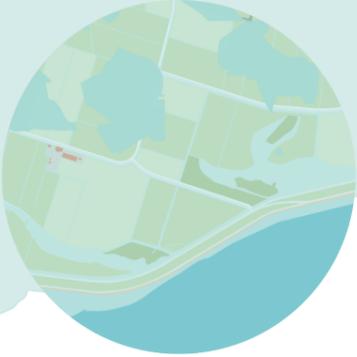
13.3 | Recreatie en toerisme in het Waddengebied, analyserapport, dr F. J. Sijtsma (RUG/RvdW), drs. G. J. Werner (RUG/RvdW) 20108

13.4 | Chapter 8, tourists to the rescue

PROJECT LOCATIONS



FLOODPLAINS
Roel Bekkers



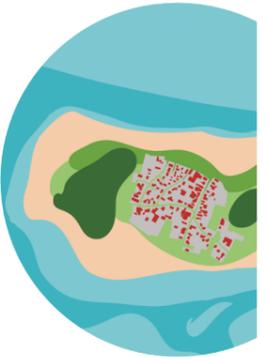
FLOODPLAINS
Tim Bolleboom



NATURAL BAY
Joost van der Zanden



NATURAL BAY
Robbert Lancel



THE ARTIFICIAL AF
Nafthaly de Graaf



RCHIPELAGO

SOURCES

Books and articles

- Natuurambitie grote wateren 2050 en verder, Dijkma, 2015
- Eilanden natuurlijk, Löffler, 2008
- Nederland in delen, rust ruimt en natuur, H. Nijmeijer CBS, 2010
- Dynamisch Kustbeheer – verstandig of verzandig?, M.E. Poelstra, 2012
- De westkust van Ameland, Rijkswaterstaat RIKZ, 2005
- Structuurvisie Ameland, Inbo, 2011
- Wadden Sea Ecosystem No. 25, A.P. Wiersma, A.P. Oost & M.W. van der Berg, 2009
- Bodemkaart van Nederland, M.F. van Oosten, 1986
- Document PAS-analyse Herstelstrategieën voor Duinen Ameland, E.J. Lammerts, 2013
- Safety and quality of the Dutch coast: toward 2100, Atelier Kustkwaliteit, 2013
- Veiligheid Nederland in Kaart 2, M.J. van Reen (Arcadis), 2014
- Ontwikkeling van de zeereep onder dynamisch kustbeheer op Oost-Ameland, B. de Jong & P.A. Slim, 2011
- Meerlaagsveiligheid in het Waddengebied, Alterra Wageningen UR, 2014
- Evaluatie van zeewaartse kustverdediging, Tj. van Heuvel, 1999
- Ameland van Oost tot West, H. Bakker, 2006
- De duivel van Ameland, A.J. Scheer, 2014
- Adellijk wonen in Friesland, Stinsen en States, 1992
- Toeristisch Actieplan Ameland, W. van hooft & T. de Bruin, 2005
- Gemeente op maat – Ameland, CBS, 2011
- Recreatie en toerisme in het waddengebied, RUG/RvdW, 2008
- Het ontstaan en de toename van het Duitse toerisme op Ameland, E. Hooijenga, 2014
- Destinatie Holland 2020, NBTC, 2008
- Consumentenonderzoek Toerisme, M de Haas & P.H. Huig, 2010
- Overkoters, seumerfreugels en fraimd schyt, M. ter Beek, 2012
- Meerjaren Marketing & Promotie Strategie VVV Ameland, J. Vork, 2010
- Meerjaren Marketing & Promotie Strategie VVV Ameland, C. Prospero, 2013

- Onderzoek erfpacht en verhuur vakantiewoningen Waddeneilanden, T.A. Verver, P. Bergmans & A.W. Zijlstra, 2012
- Global sea level linked to global temperature, Martin Vermeer, 2010
- Sociaal economische analyse en best practices van Nederlandse, Duitse en Deense Waddeneilanden, Partoer, 2013
- Ontwikkeling van het Waddengebied in tijd en ruimte, H. Speelman, 2008
- Gemeente Ameland, Nota grondprijzen 2011-2012 (2011)
- Klimaatschetsboek Nederland: het huidige en toekomstige klimaat, KNMI report, 2009
- Fundamentals of Geotourism, Sadry, 20009
- Ecotourism and Sustainable Development: Who Owns Paradise?, M. Honey, 2008
- Activiteiten in Natura 2000-gebieden Ameland, Topografische Dienst Kadaster, 2009
- Ontwerp Natura 2000 Beheerplan Ameland, Periode 2016-2022, Jan Meijer, Gabriël Vriens, Sies Krap & Evert Jan Lammerts, 2015

Websites

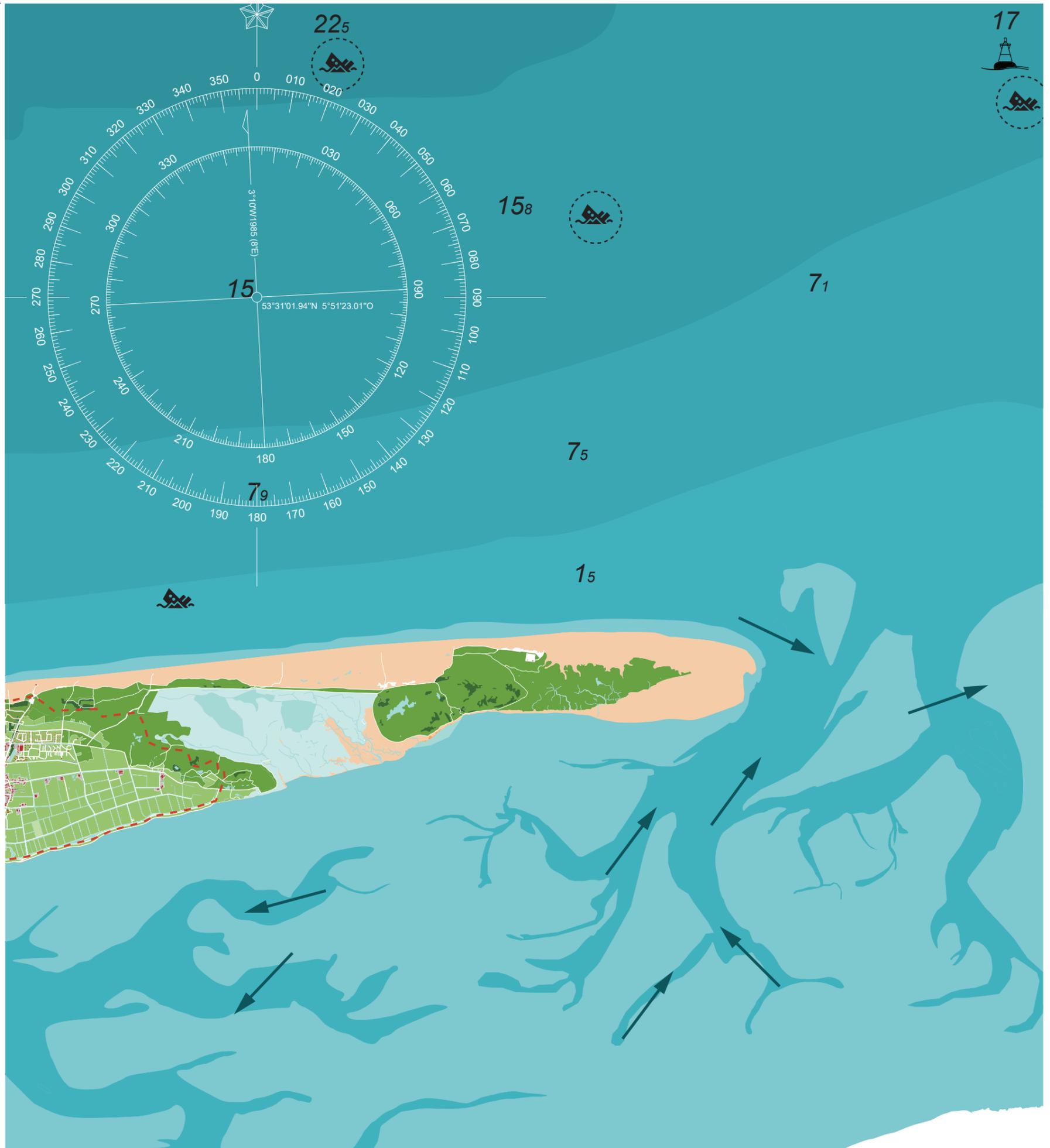
- *Rijswaterstaat (2015). Dynamisch Kustbeheer. Retrieved on 8 October 2015 via www.dynamischkustbeheer.nl*
- *R.Kiewiet (2014). De invloed van de zee op Ameland. Retrieved on 6 October 2015 via www.amelandhistorie.nl/news/de-invloed-van-zee-op-ameland/*
- *Waddenacademie (2015) Various documents. Retrieved on September and October 2015 via www.waddenacademie.nl*
- *Kiewiet, R (2015). De invloed van de zee op Ameland. Retrieved on 1 October 2015 via <http://amelandhistorie.nl>*
- *Volkers, K (2002). De dam naar Ameland. Retrieved on 1 October 2015 via www.volkskrant.nl/archief*
- *Kadaster Leeuwarden (1832) Cadastral map 1832. Retrieved on 2 October 2015 via <http://194.171.192.4/>*
- *Bleeker, Jan (2011). Ameland te kaart. Retrieved on 2 October 2015 via <http://amelandtekaart.webklik.nl/page/ameland-te-kaart>*
- *Waag Society (2015). Interactive map of all buildings in the Netherlands. Retrieved on October <http://code.waag.org/buildings/>*
- *DCA Multimedia (2015). Landvalue of the Netherlands. Retrieved on 16 oktober 2015 via <http://www.boerenbusiness.nl/grondmarkt>*
- *Wetterskip Fryslân (2015). Kijk op de dijk. Retrieved on October 2015 via www.kijkopedijk.nl*
- *VVV Ameland (2015). Kaart van Ameland. Retrieved on 3 October 2015 via www.vvvameland.nl/kaart-van-ameland*
- *De Amelander (2015). Kaart van Ameland. Retrieved on 3 October 2015 via www.deamelander.nl/live/kaart-van-ameland*
- *Waddenweer (2015). Climate on Ameland. Retrieved on 20 October 2015 via <http://waddenweer.net>*
- *Wikipedia (2013). Cultuurtoerisme. Retrieved on 3 oktober 2015 via <http://nl.wikipedia.org/wiki/Cultuurtoerisme>*
- *Persbureau Ameland (2009). Ameland gaat voor goud. Retrieved on 3 oktober 2015 via www.persbureau-ameland.nl/ameland-gaat-voor-goud*

APPENDIX

APPENDIX 1

SEAMAP





APPENDIX 2 REAL ESTATE AMELAND

AGRICULTURE					
field	region	area	m ²	€ per m ²	total €
1	Hollum	257035	m ²	€ 5,00	€ 1.285.175
2	Hollum	282579	m ²	€ 5,00	€ 1.412.895
3	Hollum	303448	m ²	€ 5,00	€ 1.517.240
4	Hollum	253734	m ²	€ 5,00	€ 1.268.670
5	Hollum	250658	m ²	€ 5,00	€ 1.253.290
6	Hollum	324680	m ²	€ 5,00	€ 1.623.400
7	Hollum	464897	m ²	€ 5,00	€ 2.324.485
8	Hollum	841669	m ²	€ 5,00	€ 4.208.345
9	Hollum	617352	m ²	€ 5,00	€ 3.086.760
10	Hollum	575495	m ²	€ 5,00	€ 2.877.475
11	Ballum	1485998	m ²	€ 5,00	€ 7.429.990
12	Ballum	1087516	m ²	€ 5,00	€ 5.437.580
13	Ballum	849213	m ²	€ 5,00	€ 4.246.065
14	Ballum	437471	m ²	€ 5,00	€ 2.187.355
15	Ballum	205814	m ²	€ 5,00	€ 1.029.070
16	Ballum	809938	m ²	€ 5,00	€ 4.049.690
17	Ballum	724104	m ²	€ 5,00	€ 3.620.520
18	Ballum	632593	m ²	€ 5,00	€ 3.162.965
19	Ballum	960024	m ²	€ 5,00	€ 4.800.120
20	Ballum	887668	m ²	€ 5,00	€ 4.438.340
21	Nes	640286	m ²	€ 5,00	€ 3.201.430
22	Nes	935069	m ²	€ 5,00	€ 4.675.345
23	Nes	358904	m ²	€ 5,00	€ 1.794.520
24	Nes	265597	m ²	€ 5,00	€ 1.327.985
25	Nes/Buren	231953	m ²	€ 5,00	€ 1.159.765
26	Nes/Buren	578721	m ²	€ 5,00	€ 2.893.605
27	Nes/Buren	389894	m ²	€ 5,00	€ 1.949.470
28	Nes/Buren	446353	m ²	€ 5,00	€ 2.231.765
29	Buren	198310	m ²	€ 5,00	€ 991.550
30	Buren	447575	m ²	€ 5,00	€ 2.237.875
31	Buren	487461	m ²	€ 5,00	€ 2.437.305
32	Buren	1080514	m ²	€ 5,00	€ 5.402.570
33	Buren	622547	m ²	€ 5,00	€ 3.112.735
total		18.935.070	m²	total	€ 94.675.350

INDUSTRY / FARM					
field	region	area	m ²	€ per m ²	total €
40	Hollum	339	m ²	€ 200,00	€ 67.800
41	Hollum	1686	m ²	€ 200,00	€ 337.200
42	Hollum	1232	m ²	€ 200,00	€ 246.400
43	Hollum	1171	m ²	€ 200,00	€ 234.200
44	Hollum	6252	m ²	€ 200,00	€ 1.250.400
45	Hollum	24820	m ²	€ 200,00	€ 4.964.000
46	Hollum	15235	m ²	€ 200,00	€ 3.047.000
47	Hollum	19573	m ²	€ 200,00	€ 3.914.600
48	Hollum	27745	m ²	€ 200,00	€ 5.549.000
49	Hollum	12696	m ²	€ 200,00	€ 2.539.200
50	Hollum	7707	m ²	€ 200,00	€ 1.541.400

51	Ballum	3551	m ²	€ 200,00	€ 710.200
52	Ballum	10023	m ²	€ 200,00	€ 2.004.600
53	Ballum	6807	m ²	€ 200,00	€ 1.361.400
54	Ballum	7557	m ²	€ 200,00	€ 1.511.400
55	Ballum	29957	m ²	€ 200,00	€ 5.991.400
56	Ballum	22872	m ²	€ 200,00	€ 4.574.400
57	Ballum	5412	m ²	€ 200,00	€ 1.082.400
58	Ballum	8043	m ²	€ 200,00	€ 1.608.600
59	Ballum	29920	m ²	€ 200,00	€ 5.984.000
60	Ballum	8660	m ²	€ 200,00	€ 1.732.000
61	Ballum	979	m ²	€ 200,00	€ 195.800
62	Ballum	23072	m ²	€ 200,00	€ 4.614.400
63	Ballum	29274	m ²	€ 200,00	€ 5.854.800
64	Ballum	12013	m ²	€ 200,00	€ 2.402.600
65	Ballum	5830	m ²	€ 200,00	€ 1.166.000
66	Ballum	9415	m ²	€ 200,00	€ 1.883.000
67	Ballum	8563	m ²	€ 200,00	€ 1.712.600
68	Nes	5635	m ²	€ 200,00	€ 1.127.000
69	Nes	267	m ²	€ 200,00	€ 53.400
70	Nes	253	m ²	€ 200,00	€ 50.600
71	Nes	96	m ²	€ 200,00	€ 19.200
72	Buren	5484	m ²	€ 200,00	€ 1.096.800
73	Buren	4773	m ²	€ 200,00	€ 954.600
74	Buren	4483	m ²	€ 200,00	€ 896.600
75	Buren	6492	m ²	€ 200,00	€ 1.298.400
76	Buren	5815	m ²	€ 200,00	€ 1.163.000
77	Buren	7299	m ²	€ 200,00	€ 1.459.800
78	Buren	631	m ²	€ 200,00	€ 126.200
79	Buren	3706	m ²	€ 200,00	€ 741.200
80	Buren	64411	m ²	€ 200,00	€ 12.882.200
total		449.749	m²	total	€ 89.949.800

HOUSING					
field	region	area	m ²	€ per m ²	total €
81	Hollum	0	m ²	€ 360,00	€ 0
82	Hollum	0	m ²	€ 360,00	€ 0
83	Hollum	0	m ²	€ 360,00	€ 0
84	Hollum	0	m ²	€ 360,00	€ 0
85	Hollum	0	m ²	€ 360,00	€ 0
86	Hollum	0	m ²	€ 360,00	€ 0
87	Hollum	0	m ²	€ 360,00	€ 0
88	Ballum	0	m ²	€ 360,00	€ 0
89	Ballum	0	m ²	€ 360,00	€ 0
90	Buren	0	m ²	€ 360,00	€ 0
total		28.463	m²	total	€ 10.246.680

RECREATION					
field	region	area	m ²	€ per m ²	total €
101	Hollum	267	m ²	€ 700,00	€ 186.900

102	Hollum	67	m ²	€ 700,00	€ 46.900
103	Hollum	15091	m ²	€ 300,00	€ 4.527.300
104	Hollum	88	m ²	€ 300,00	€ 26.400
105	vuurtoren	47	m ²	€ 2.500,00	€ 117.500
106	Hollum	13658	m ²	€ 400,00	€ 5.463.200
107	Hollum	5551	m ²	€ 400,00	€ 2.220.400
108	Hollum	111	m ²	€ 1.200,00	€ 133.200
109	Hollum	117	m ²	€ 1.200,00	€ 140.400
110	Hollum	68	m ²	€ 1.200,00	€ 81.600
111	Hollum	3545	m ²	€ 1.200,00	€ 4.254.000
112	Hollum	10202	m ²	€ 300,00	€ 3.060.600
113	B'hiemke	449527	m ²	€ 500,00	€ 224.763.500
114	Hollum	5489	m ²	€ 300,00	€ 1.646.700
115	Hollum	21288	m ²	€ 500,00	€ 10.644.000
116	Hollum	4123	m ²	€ 500,00	€ 2.061.500
117	Hollum	12301	m ²	€ 300,00	€ 3.690.300
118	Hollum	7206	m ²	€ 300,00	€ 2.161.800
119	Hollum	10406	m ²	€ 300,00	€ 3.121.800
120	Roosdunen	362174	m ²	€ 400,00	€ 144.869.600
121	Ballum	7071	m ²	€ 300,00	€ 2.121.300
122	Ballum	5066	m ²	€ 300,00	€ 1.519.800
123	Ballum	2693	m ²	€ 500,00	€ 1.346.500
124	Ballum	6182	m ²	€ 500,00	€ 3.091.000
125	Nes	19279	m ²	€ 200,00	€ 3.855.800
126	Nes	6333	m ²	€ 200,00	€ 1.266.600
127	Nes	355	m ²	€ 1.200,00	€ 426.000
128	Nes	122	m ²	€ 1.200,00	€ 146.400
129	Nes	201	m ²	€ 1.200,00	€ 241.200
130	Nes	230	m ²	€ 1.200,00	€ 276.000
131	Nes	561	m ²	€ 1.200,00	€ 673.200
132	Nes	38480	m ²	€ 200,00	€ 7.696.000
133	Landal	145607	m ²	€ 500,00	€ 72.803.500
134	Iduna	146955	m ²	€ 500,00	€ 73.477.500
135	Nat'centrum	12940	m ²	€ 300,00	€ 3.882.000
136	Nes	2256	m ²	€ 500,00	€ 1.128.000
137	Nes	2014	m ²	€ 500,00	€ 1.007.000
138	Zwembad	2892	m ²	€ 500,00	€ 1.446.000
139	Nes	361	m ²	€ 500,00	€ 180.500
140	Nes	98	m ²	€ 500,00	€ 49.000
141	Buren	6362	m ²	€ 500,00	€ 3.181.000
142	Buren	2434	m ²	€ 500,00	€ 1.217.000
143	Buren	695	m ²	€ 500,00	€ 347.500
144	Buren	1660	m ²	€ 500,00	€ 830.000
145	Kiekduun	939992	m ²	€ 500,00	€ 469.996.000
146	Buren	1426	m ²	€ 500,00	€ 713.000
147	Kooiplaats	5626	m ²	€ 500,00	€ 2.813.000
148	Kooiplaats	1308	m ²	€ 500,00	€ 654.000
149	Strandtent	820	m ²	€ 300,00	€ 246.000
150	Strandtent	310	m ²	€ 500,00	€ 155.000
	total	2.281.655	m²	total	€ 1.070.003.400

VILLAGES					
field	region	area	m ²	€ per m ²	total €
200	Hollum	569668	m ²	€ 700,00	€ 398.767.600
300	Ballum	217706	m ²	€ 700,00	€ 152.394.200
400	Nes	490340	m ²	€ 700,00	€ 343.238.000
401	Nes industry	166942	m ²	€ 250,00	€ 41.735.500
500	Buren	330049	m ²	€ 700,00	€ 231.034.300
	total	1.774.705	m²	total	€ 1.167.169.600

APPENDIX 3

LIST OF STAKEHOLDERS

Stakeholders / Persons of Interest							
persoon	functie	telefoon	e-mail	relevantie	adres	postcode	plaats
Nico Oud	wethouder	-	noud@ameland.nl	afdeling: bouw- en woningtoezicht, volkshuisvesting, stadsvernieuwing, monumentenzorg, enz.			
Bouwbedrijf Kienstra		0519-542071	info@kienstra-ameland.nl	HET bouwbedrijf en ontwerp bureau van Ameland			
Annie Bakker-van Dijk	vrijwilligster Sorgdrager museum	0519-554149	jd.bakker01@knid.nl	oud lerares op ameland, nu raadslid pvda Hollum en vrijwilliger bij het Sorgdrager museum	Westerlaan 4	9161 AP	Hollum
Tonnie Overdiep	(voorm.) hoofd Rijkswaterstaat			30 jaar werkzaam geweest bij kustverdediging Waddeneilanden	Reeweg 23	9163 GT	Nes
Jan de Vries	oud secr v.d. Gemeente				Reddingsbootweg 15	9161 CP	Hollum
Piet IJnsenn	raadslid				Oosterlaan 18	9161 MC	Hollum
Sjon de Haan	Beleidsadviseur Ameland						
Cinto Prosperi	Directeur VVV Ameland						
Albert De Hoop	Burgemeester Ameland						
Joke Bijl	Staatsbosbeheer	030-6926210	persinfo@staatsbosbeheer.nl	staatsbosbeheer: beschermen en beheren van groen erfgoed			
Robert Zeilstra	Rijkswaterstaat	06-22481836	Robert.zeilstra@rws.nl	beheer van duinen. Kennis van dynamisch kustbeheer en Natuurambitie grote wateren 2050 en verder			
-	Wetterskip Fryslan	058-2922222		beheer van de dijk op Ameland	François HaverSchm	8914 BC	Leeuwarden
Jeanet de Jong	Persbureau Ameland			auteur van boek: 'Boeren op Ameland'. Heeft met alle boeren op het eiland aan tafel gezeten			
Annette van Driel	Urban Campsite	06-23460571	info@urbancampsiteamsterdam.nl	nieuwe vormen van kamperen. Soort van expositie.	Pampuslaan 501	1087 HP	Amsterdam
-	Roompot vakanties	0113-374160		grote speler op het gebied van het ontwikkelen van recreatie op Ameland	Mariapolderseweg 1	4493 PH	Kamperland
Maaïke Bos	Deltares	088 3357809	Maaïke.Bos@deltares.nl	combineert als landschapsarchitect de disciplines landschapsarchitectuur en watermanagement.			
Eric-Jan Pleijster	LOLA landscape architect	010 4141368	info@lolaweb.nl	ontwerpen voor natuurlijk herstel en recreatief gebruik. Grevelingen, het Volkerak en het Haringvliet.			
Architecten / bouwkundigen actief op Ameland							
David van Geest (ARTE)	ingenieur	0512 300 750	info@artebouw.nl	Bouwkundig bureau met diverse projecten op Ameland			
TWA architecten		0519-241550	info@TWA-architecten.nl	architecten van het natuurcentrum te Nes			
onderzoekers / wetenschappers							
Albert Postema	onderzoeker			auteur van onderzoek "When the tourist flew in"			
Johan Krol	ecoloog			werkt bij natuurcentrum ameland, onderzoeker voor bodemdalingscommissie			

