BORDERSCAPE

- *Increasing the level of permeability in between land and sea (at coastal Northern Netherlands)*

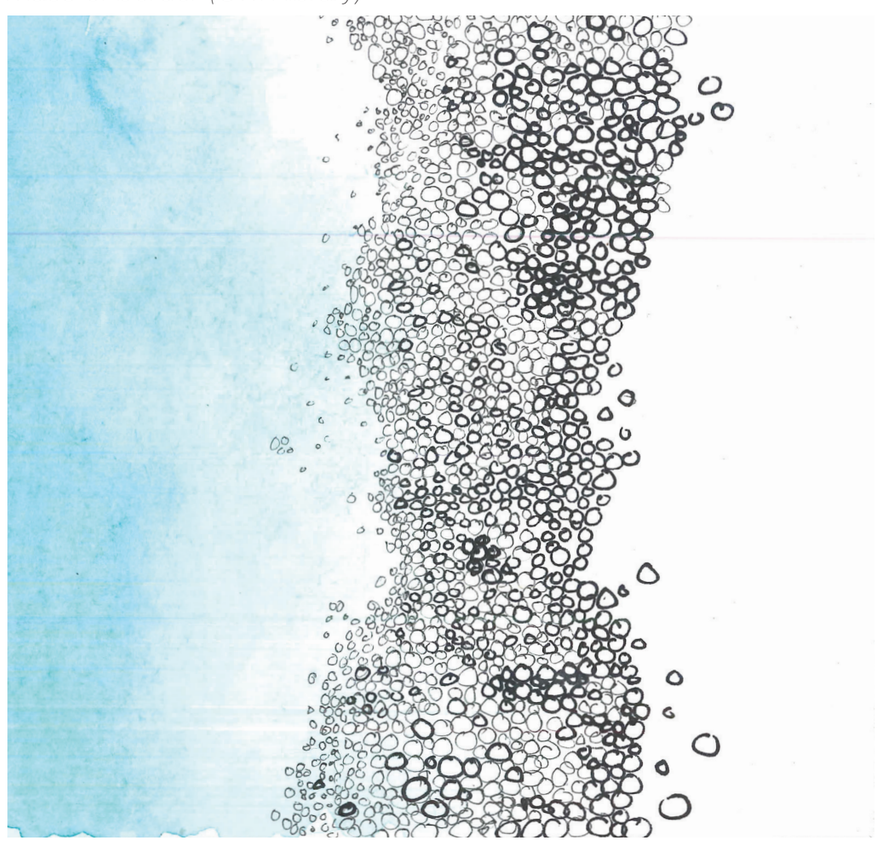
Marshland, Wadden sea area, Holwerd

"A coastal **borderscape** *is an living transition zone that connects land and sea. This zone supports different processes (land and sea) and human practises to pass and to interact; letting flows in and out selectively by being porous and resistant simultaneously. In time, the zone is getting nourished and is able to adapt in use, appearance, and permeability"*

(Sources: M. Eker, R. Sennett, M. Heidegger)

IThe border as a dynamic mass - as an **ambiguous** *zone in natural ecology*

Mass of border (Own library)



P2

- *Introduction borderscapes and test location*

- *Research framework*

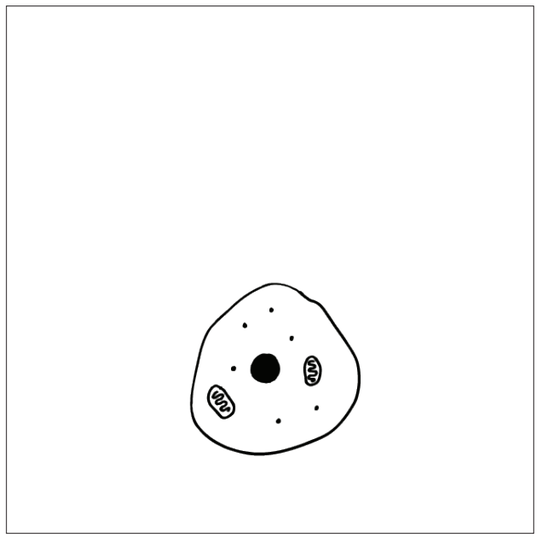
- *From theory to instrumental design principles*

- *Analysis*

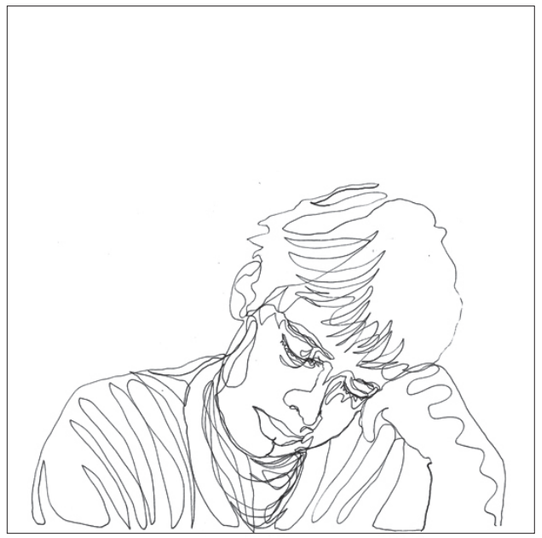
- *Design experiments*

INTRODUCTION

Human tend to see borders as lines



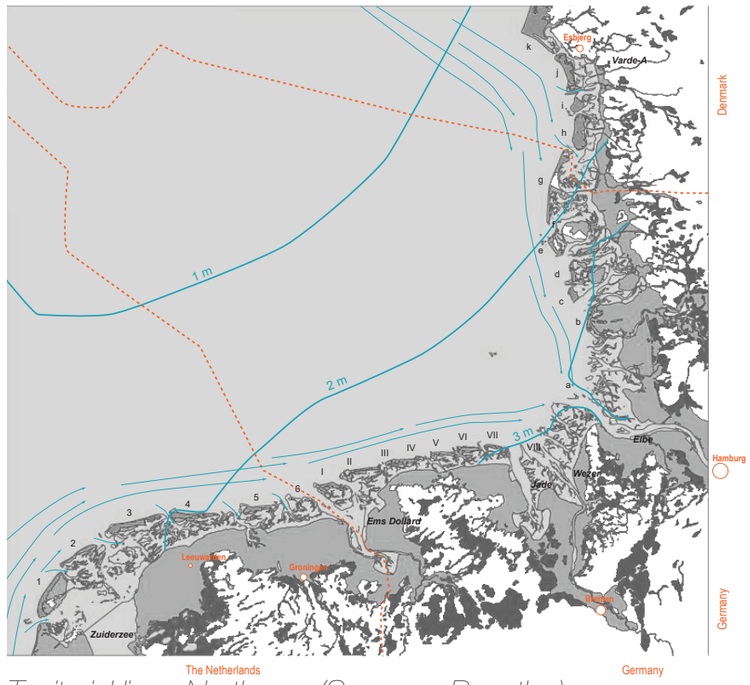
Animal cell



Drawing of a person (Picasso)

European map outline

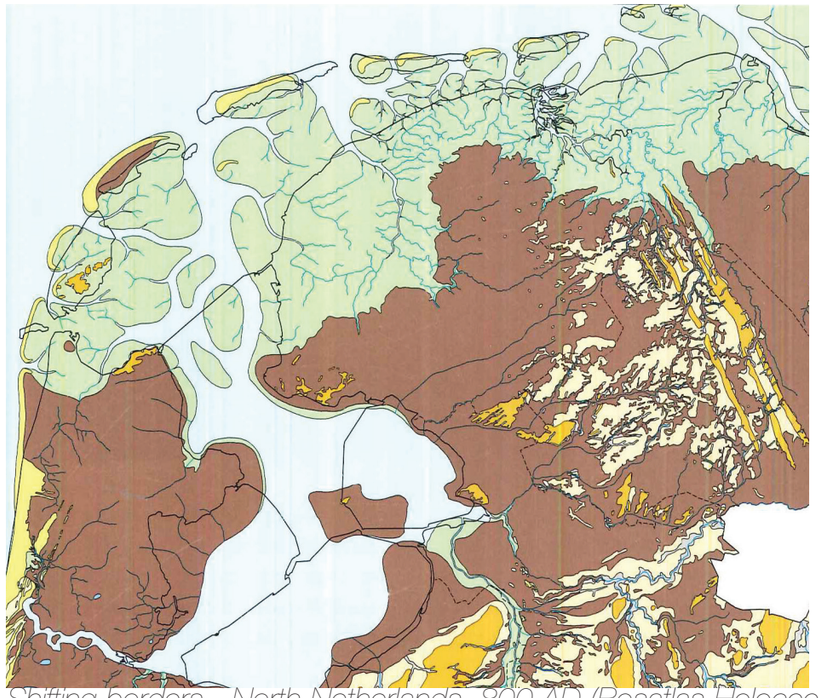
Case study: Wadden area seen as potential for establishing a borderscape



Territorial lines North sea (Sources: Bosatlas)

Wadden sea area World Heritage UNESCO (Google earth)

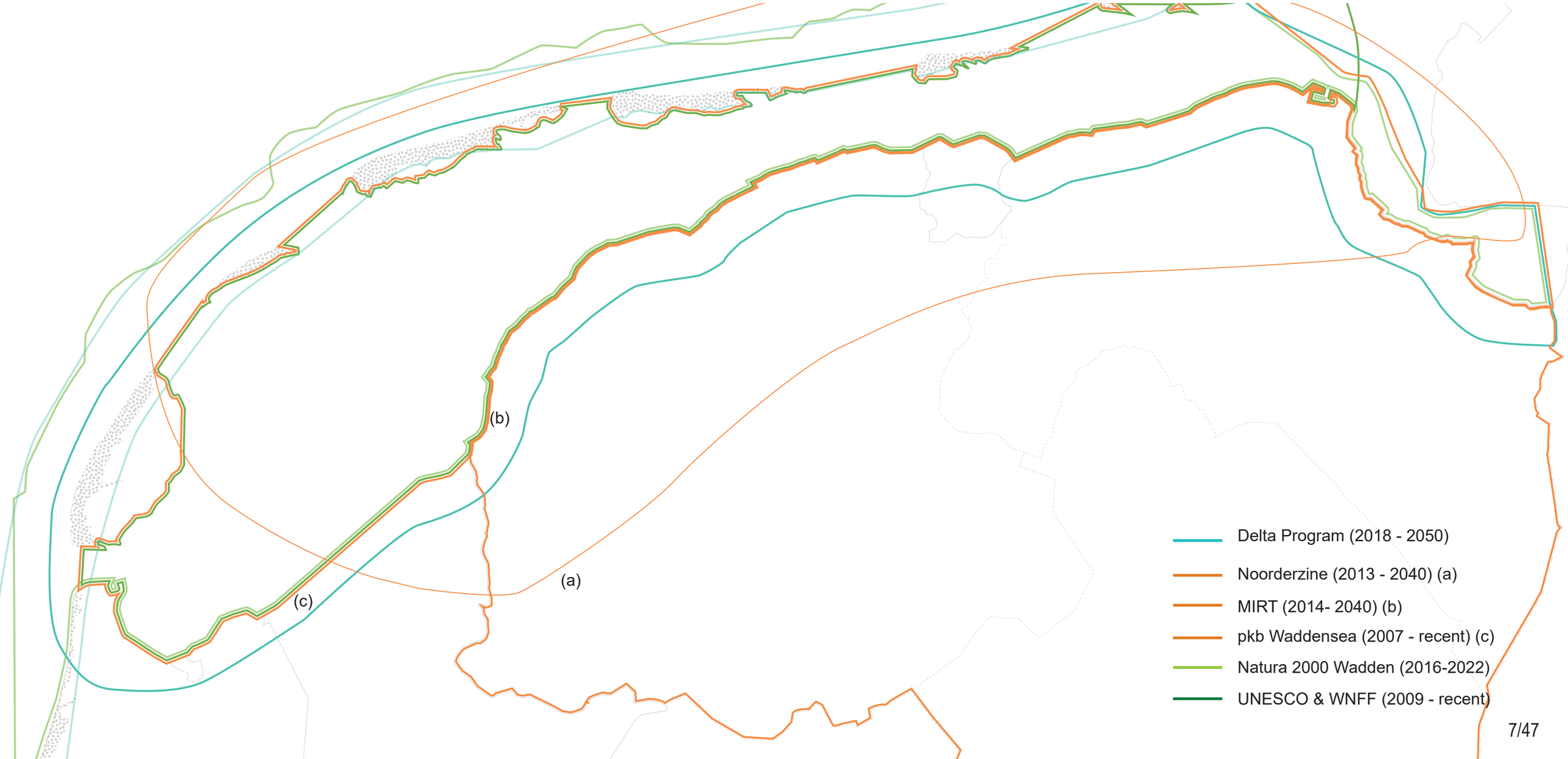
The Northern Netherlands as a potential borderscape as culture history is intertwined with water. Currently, the dike is mo-no-functional



Shifting borders - North Netherlands, 800 AD (Bosatlas Holoceen)

Dike as narrow line for water defense (Rijkswaterstaat)

The dike as a administrative line



Impermeable borders are reaching their limits vs. successful 'new' bufferzones along Dutch Delta

"The system can hold a sea level rise of maximum 2 meters" (prof. B Jonkman TU Delft, Volkskrant, 2018)

"The Dutch land declines three times as fast as the sea level rise. This can partly be solved by using the natural process of sedimentation" (M. Kleinhans, University Utrecht, 2018)

Impermeable borders January 2018 (Sources: Telegraaf, AD, Volkskrant)

VS.

Riverpark Nijmegen along Waal (Sources: Stedebouw& architectuur)

Relevance of **borderscapes**: *multi-functional (water safety, economy and ecology), adaptive and experienceable*

Hunstanton, UK: sport, recreation, fishing (Own library)

Sand engine Kijkduin: recreation, ecology (Rijkswaterstaat)

Sluftervalley, Texel: ecology, recreation

Hondssbosche zeewering, Petten: ecology, recreation

Southend pier, UK: recreation, former railway for goods

Bensersiel, Germany: recreation, accomodation, ecology, harbour

PROBLEM STATEMENT

The current border between land and sea in Northern Netherlands, the dike, does **not support the exchange** *of processes between land and sea* **neither gives a zone** *for a gradual transition.*

Panorama-view from dike, Holwerd (Own library)

BORDER

LAND
CULTURE
FRESH WATER
POLDER SYSTEM
SUBSIDENCE
NETHERLANDS

NARROW
IMPERMEABLE
MONO-FUNCTIONAL
RIGID
INEXPERIENCEABLE

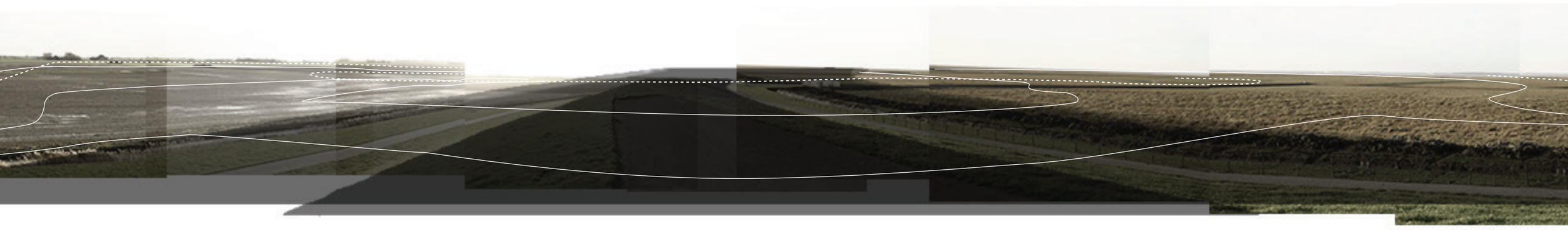
SEA
NATURE
SALT WATER
TIDAL INFLUENCE
SEDIMENTATION
UNESCO WORLD HERITAGE

RESEARCH OBJECTIVE

To develop instrumental design principles for a borderscape *between land and sea tested by* a site-specific design that increases the permeability *along the coastal zone of the Northern Netherlands.*

TRANSITION ZONE

Panorama-view from dike, Holwerd (Own library)

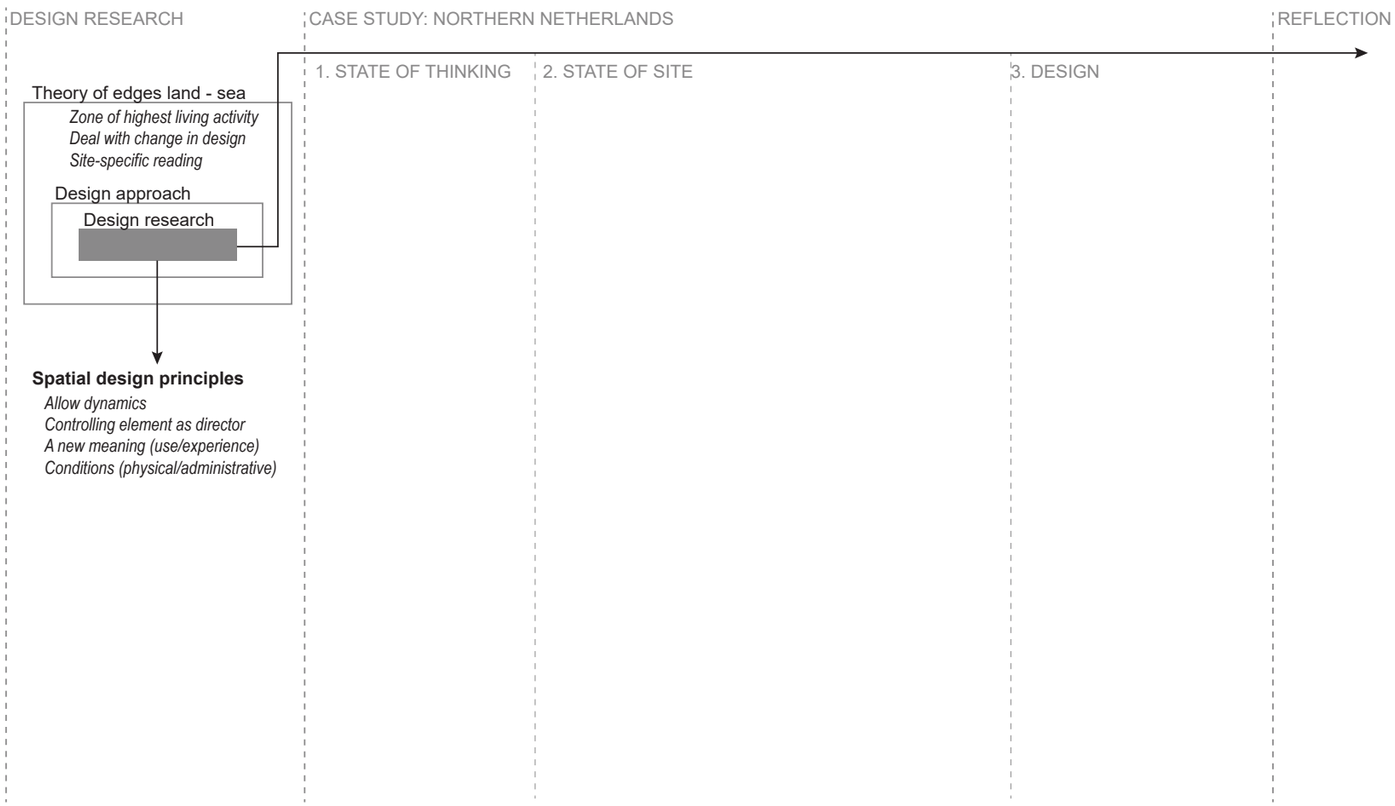


RESEARCH QUESTIONS

//Which instrumental design principles can be developed that increase the permeability between land and sea establishing a borderscape?

//Which instrumental design principles can be developed that increase the permeability between land and sea establishing a borderscape?

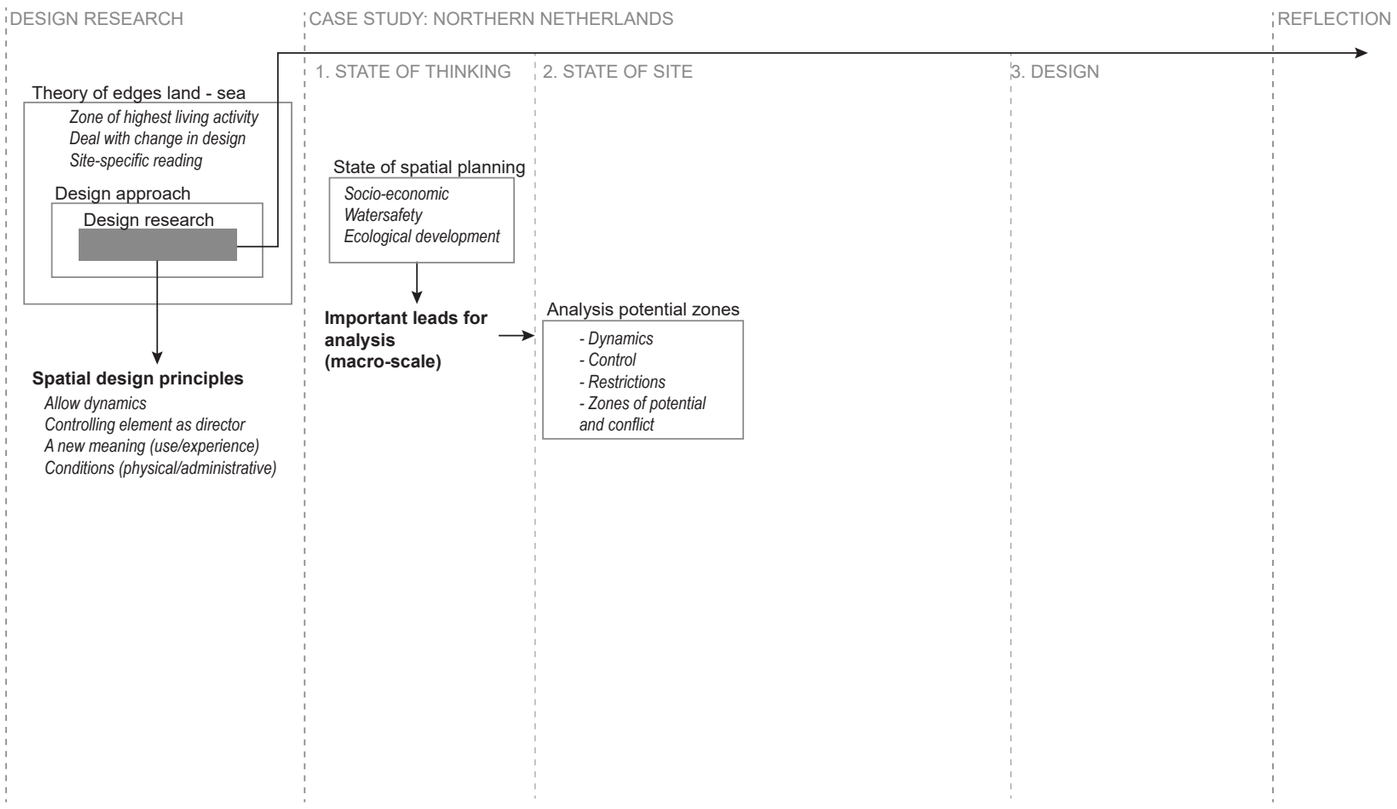
//Which instrumental design principles can be extracted from the three main attitudes towards edges between land and sea? (multi-functional zone, adaptive capacity, site-specific reading)



//Which instrumental design principles can be developed that increase the permeability between land and sea establishing a borderscape?

//Which instrumental design principles can be extracted from the three main attitudes towards edges between land and sea? (multi-functional zone, adaptive capacity, site-specific reading)

//How can the potential zones of higher permeability in the Northern Netherland be identified taking into account the state of the art of spatial development and planning there?



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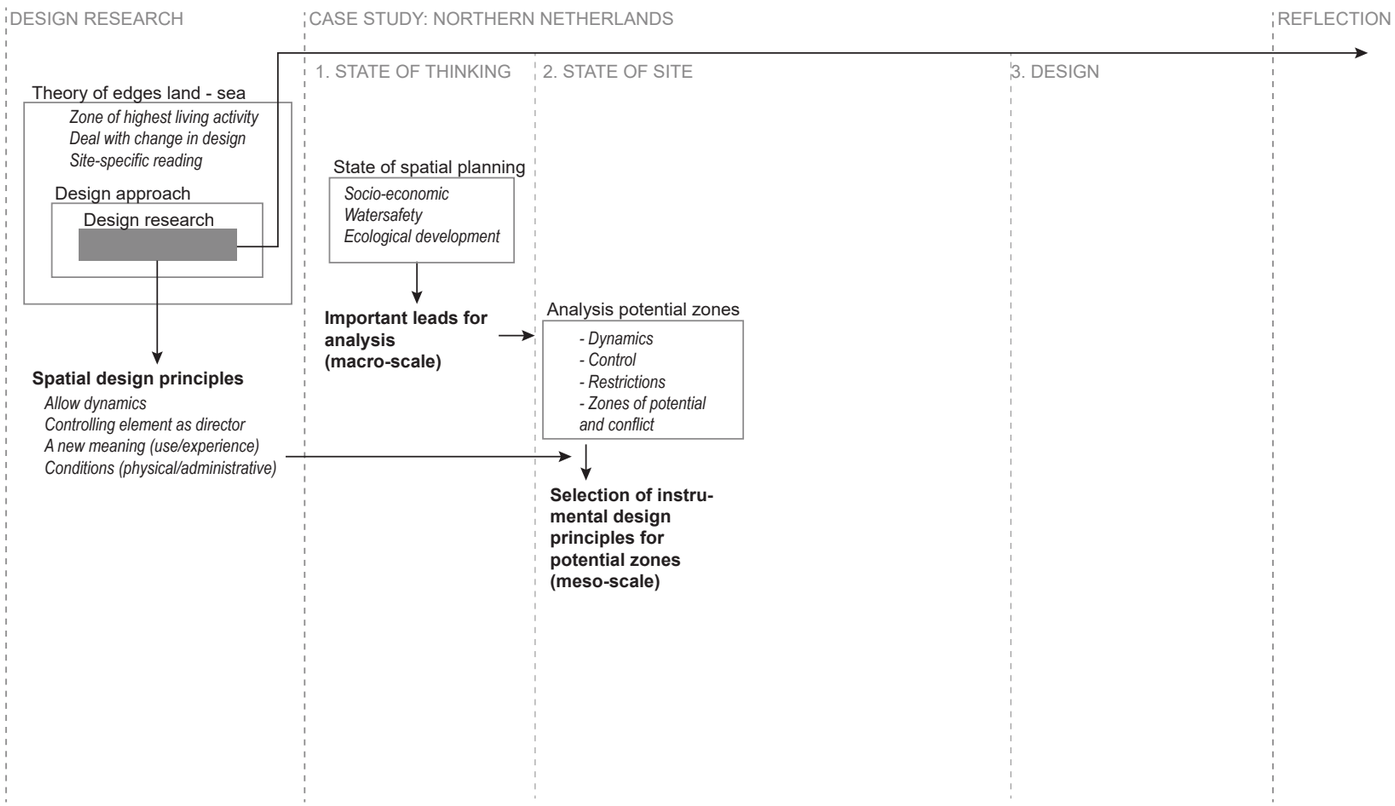
//Given the potential zones of higher permeability, which set of instrumental design principles can be selected for each zone?



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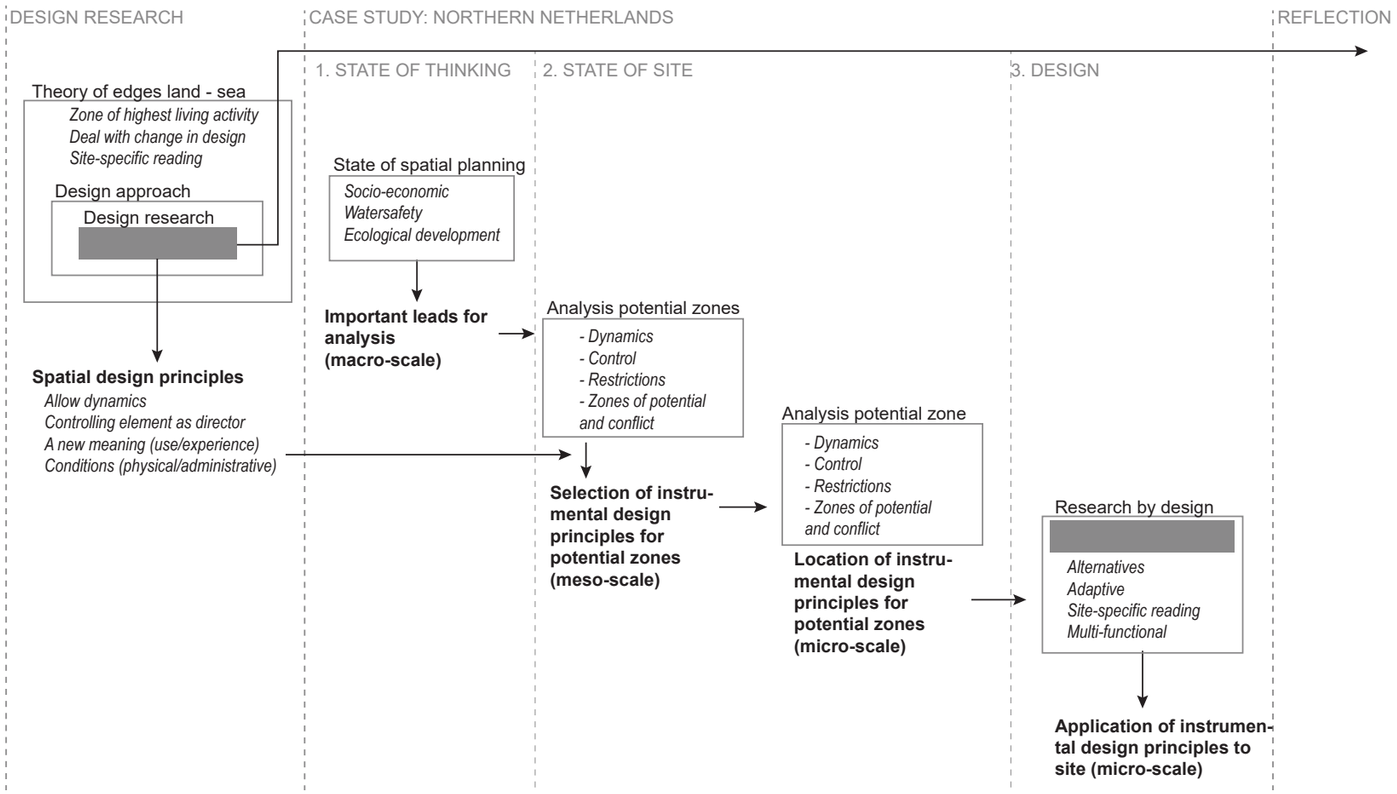
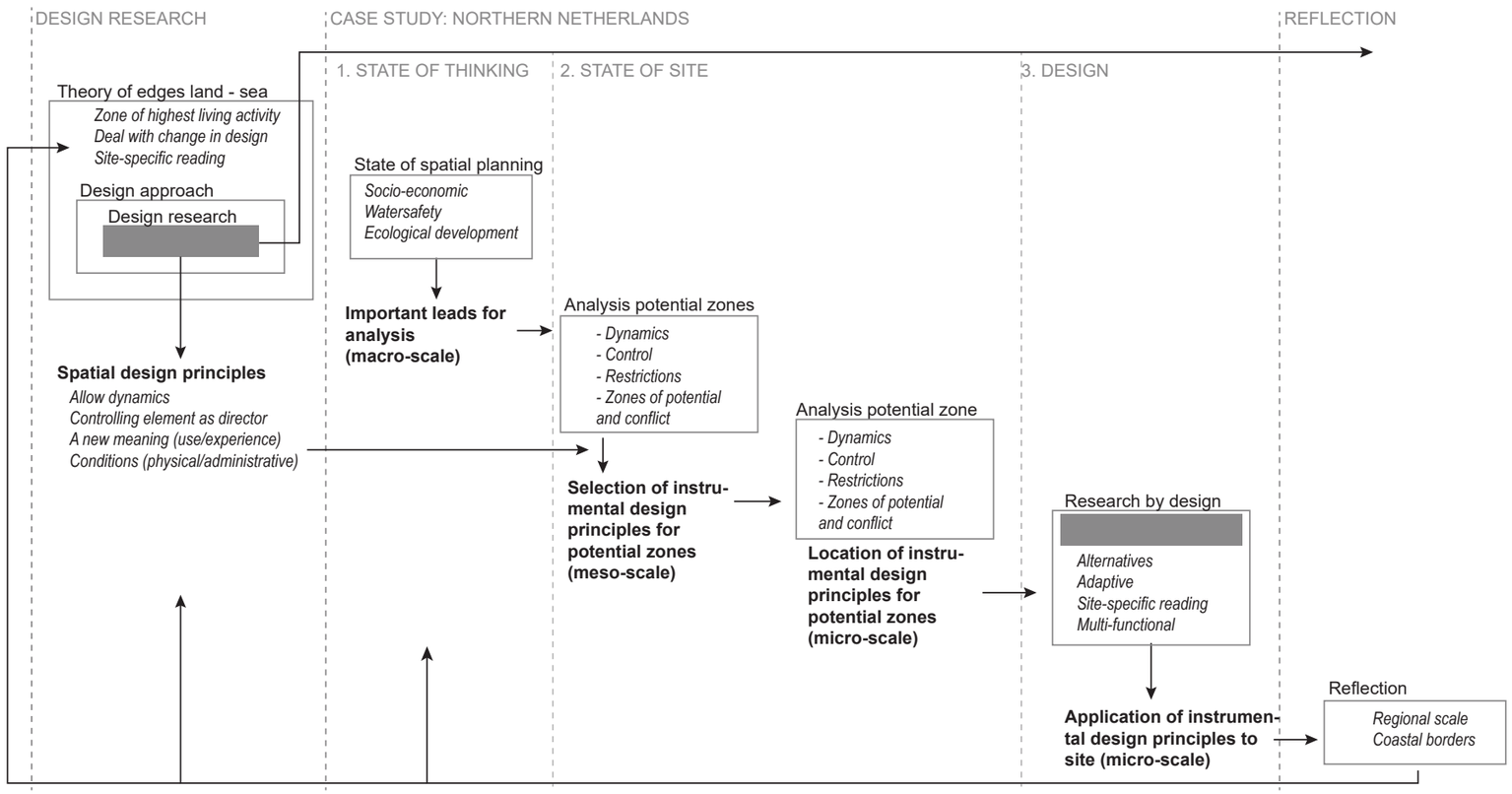
//How can the potential zones of higher permeability in the Northern Netherland be identified taking into account the state of the art of spatial development and planning there?

//Given the potential zones of higher permeability, which set of instrumental design principles can be selected for each zone?

//How can the instrumental design principles be applied in a site-specific design of a potential zone?



Reflection: usability and application of principles on different scales



OVERVIEW SCALES

Macro- scale: *Understanding processes and perceptions of the border*

Meso-scale: *Potential zones of higher permeability along the coastline*

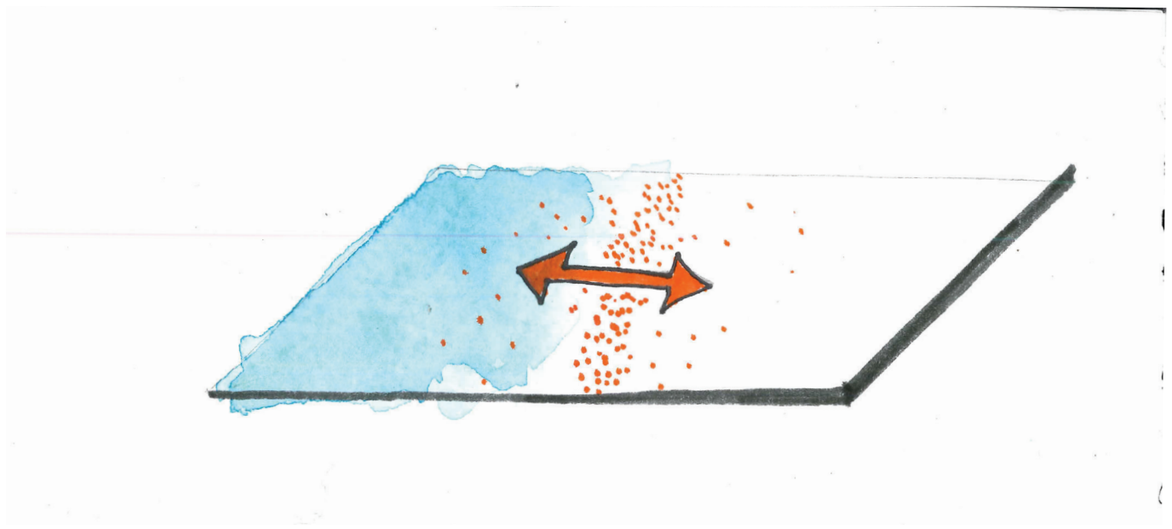
Micro-scale: *Site-specific design of borderscape*

THEORETICAL ATTITUDES OF DESIGNING BORDERSCAPES

The border as a zone with the highest living activity

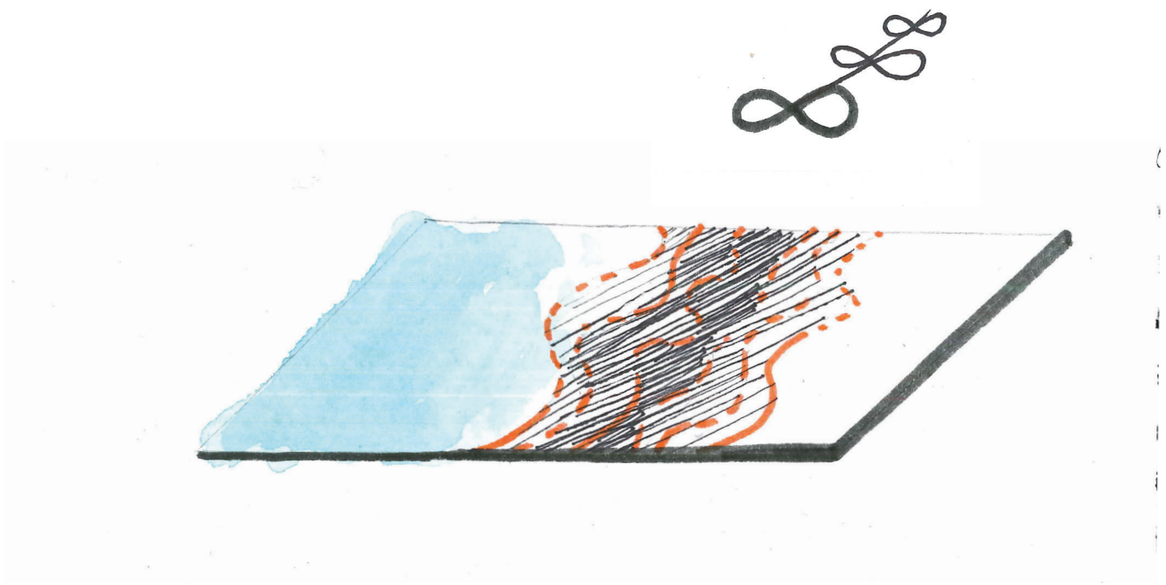
Dee, C. (2001). Form and Fabric in Landscape Architecture. A visual introduction. Spon Press, London
Dramstadt, W.E. et al. (1996). Landscape Ecology Principles in Landscape Architecture and Land-Use Planning. Island Press, Harvard
Eker, M (2013). Borderland. History and future of the border landscape. Lecturis, Eindhoven
Sennett, R (2011). Boundaries and borders

Tjallingii, S. (2015). Planning with water and traffic networks. Carrying structures of the urban landscape. Research In Urbanism Series, 3 (1), 57-80



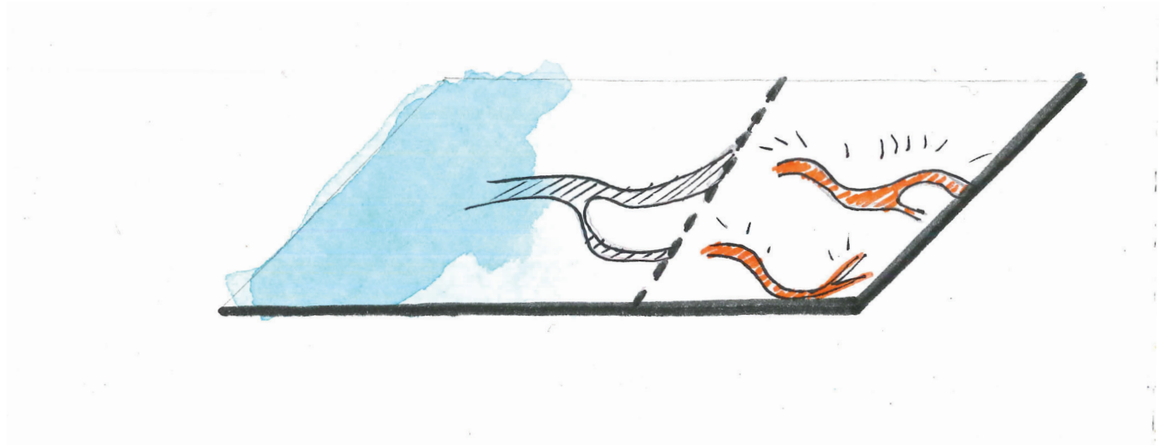
Uncertainties as a stimulus to deal with change is spatial design

Braae, E. (2012), Intervention. On the Transformation of Ruinous Industrial Landscapes. Risskov, Ikaros Press.
Haasnoot, M. (2012). Dynamic adaptive policy pathways: A method for crafting robust decisions for a deeply uncertain world
Holling, C.S. (2001). Understanding the Complexity of economic, ecological, and social systems



Site-specificity of the borderscape as a relational specificity

Berleant, A. (2012) The changing meaning of landscape.
Braae, E. & Diedrich, L. (2012). Site specifcity in contemporary largescale harbour transformation projects. Journal of Landscape Architecture, 7:1, 20-33
Diedrich, L. (2011). Site-specifc landscape architectural approaches in contemporary European harbour transformation. Portus Plus
Lassus, B. (1998). The obligation of invention. The Landscape Approach. Philadelphia: University of Pennsylvania Press, pp 67-77 and 143-149
Van der Ham, W. (2002). Waterlandschappen. De cultuurhistorie van de toekomst als opgave voor het waterbeheer



TRANSLATION OF ATTITUDES INTO SPATIAL PRINCIPLES

Allow different types of **dynamics** *to happen in time and space*

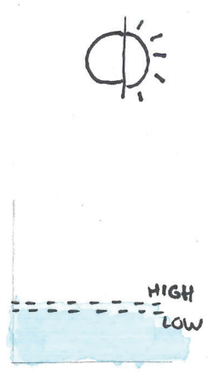
Iteration

Infinite cycles

Temporal/once

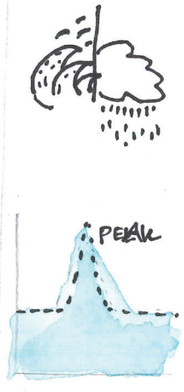
Infinite stretch

Time scales



Tidal

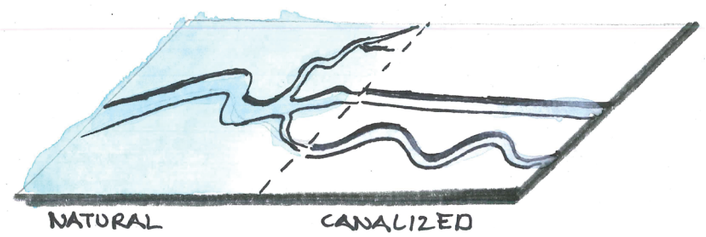
Seasonal



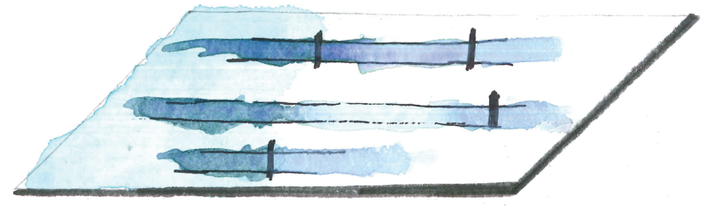
Extreme

Decades

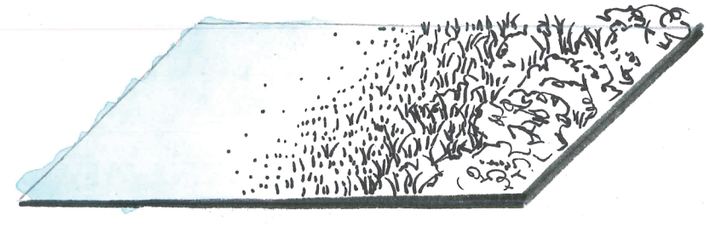
Space



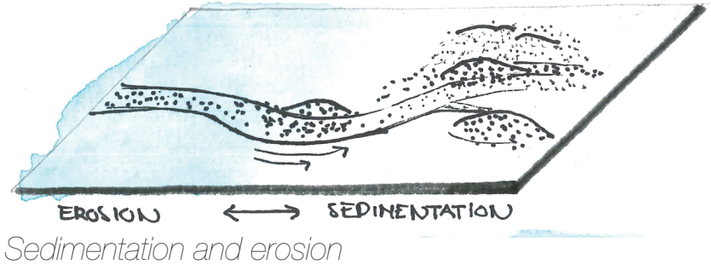
Patterns and shape of waterbodies



Connection of watersystems (fresh/salt)



Natural succession of vegetation



Sedimentation and erosion

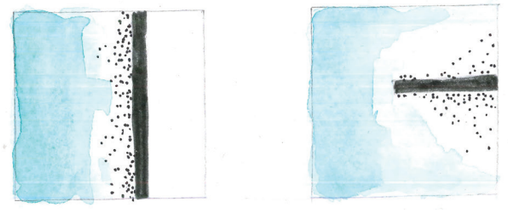
Have **controlling elements** *that are more fixed to direct the change and to establish more safety than now*

Mass

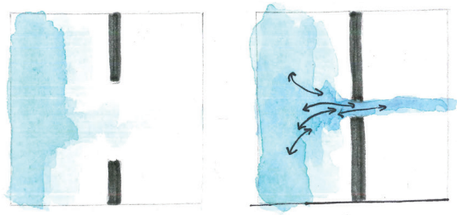
Height

Materialization

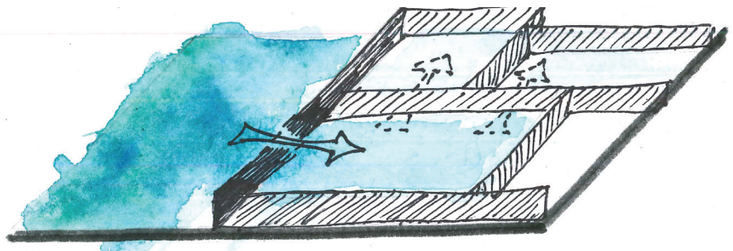
Direction



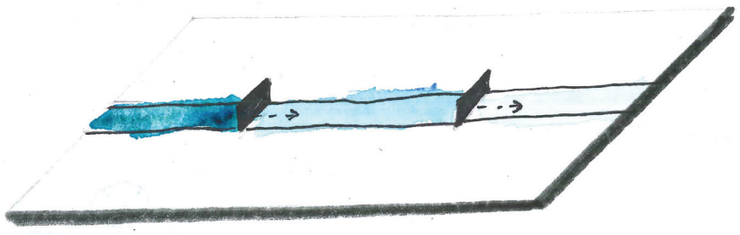
Size of opening



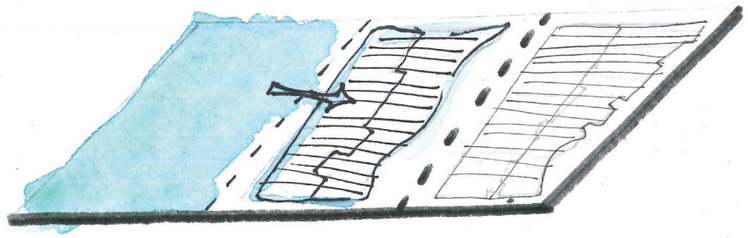
System



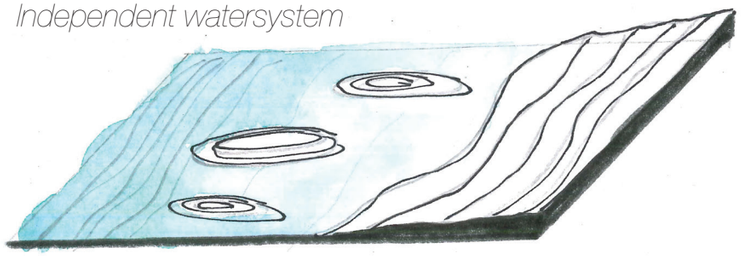
System of basins



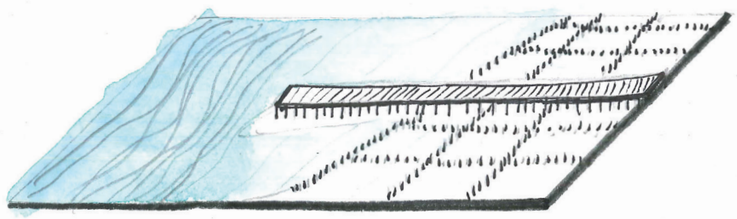
System of sluices along waterways



Independent watersystem

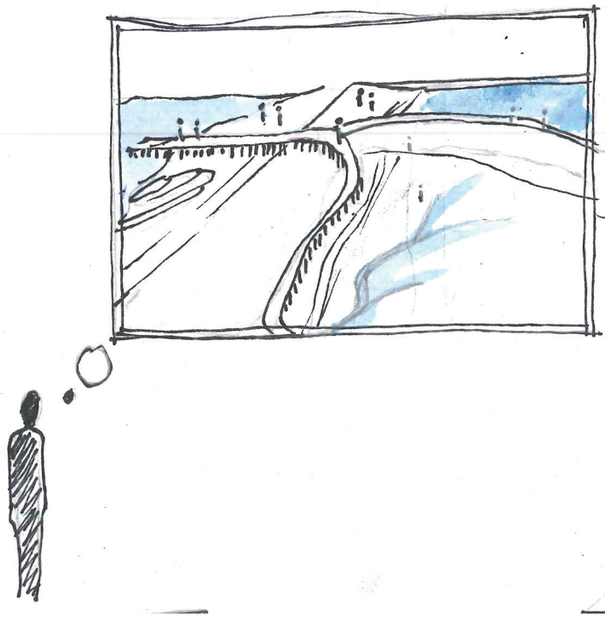


Topography as wave breakers and controller

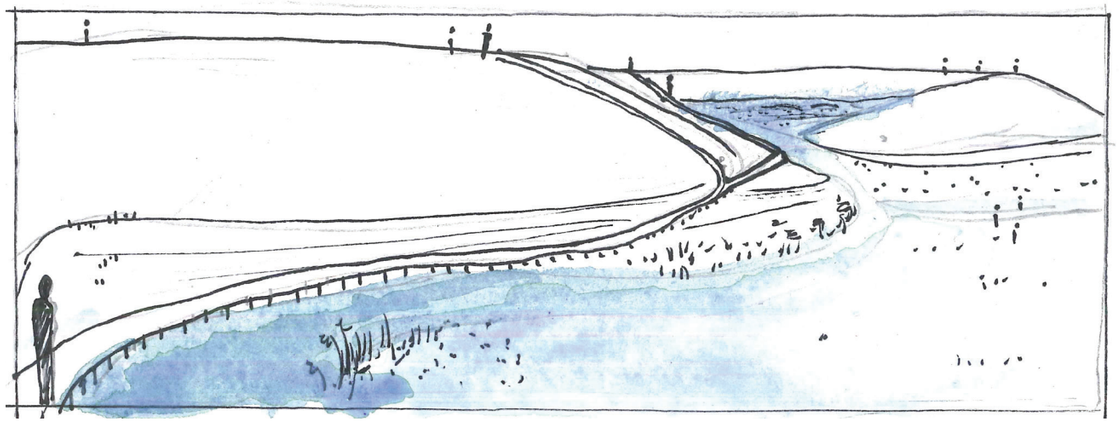


Grid of reclemation poles for wave breakers and catchment of sediments

Give a new meaning for experience and use of human **to be 'in'** *a borderscape*

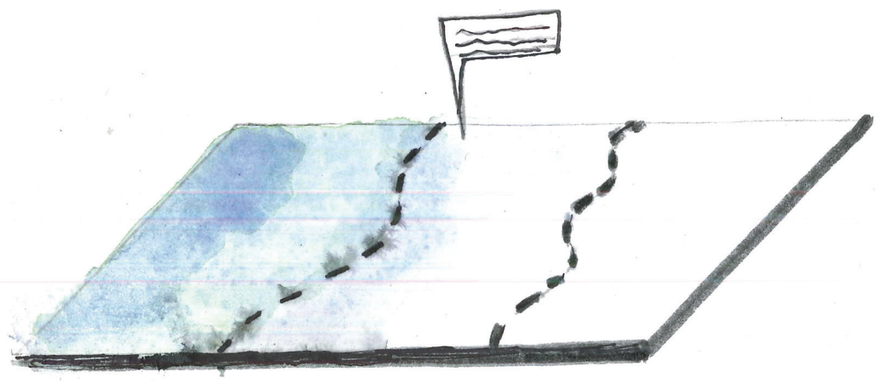


New image of the border as a physical zone and integrated system

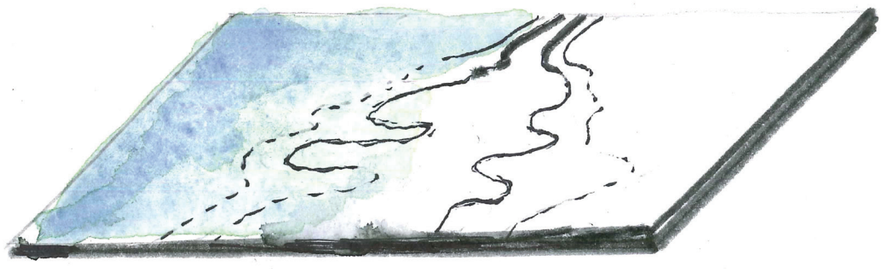


Creating an experience of being 'in' a borderscape which uses correspond to the dynamic character of a border

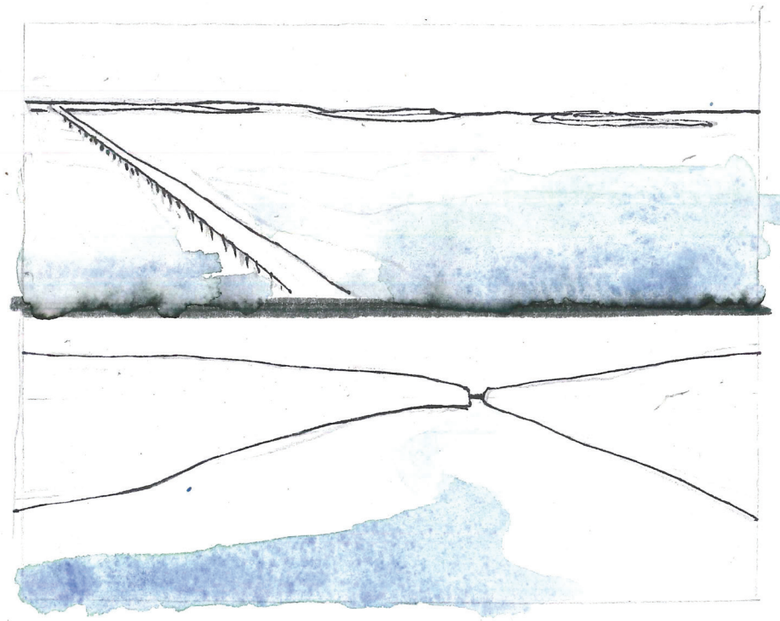
Support the transition zone by designing the suitable **spatial** *and* **administrative conditions**



A seperate administrative status



Suitable physical space: surface, length coastline etc.

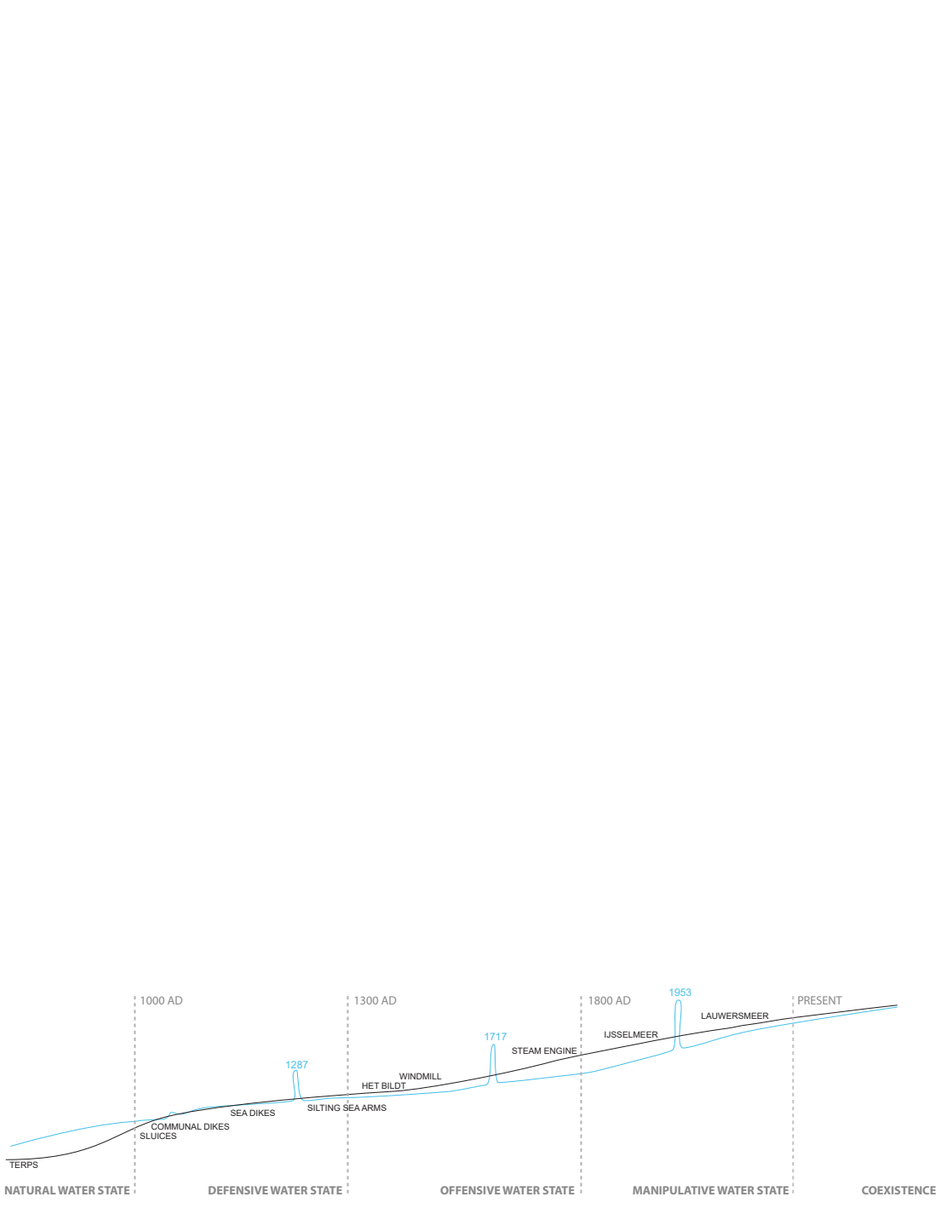


Suitable pysical space: wide/enclosed etc.

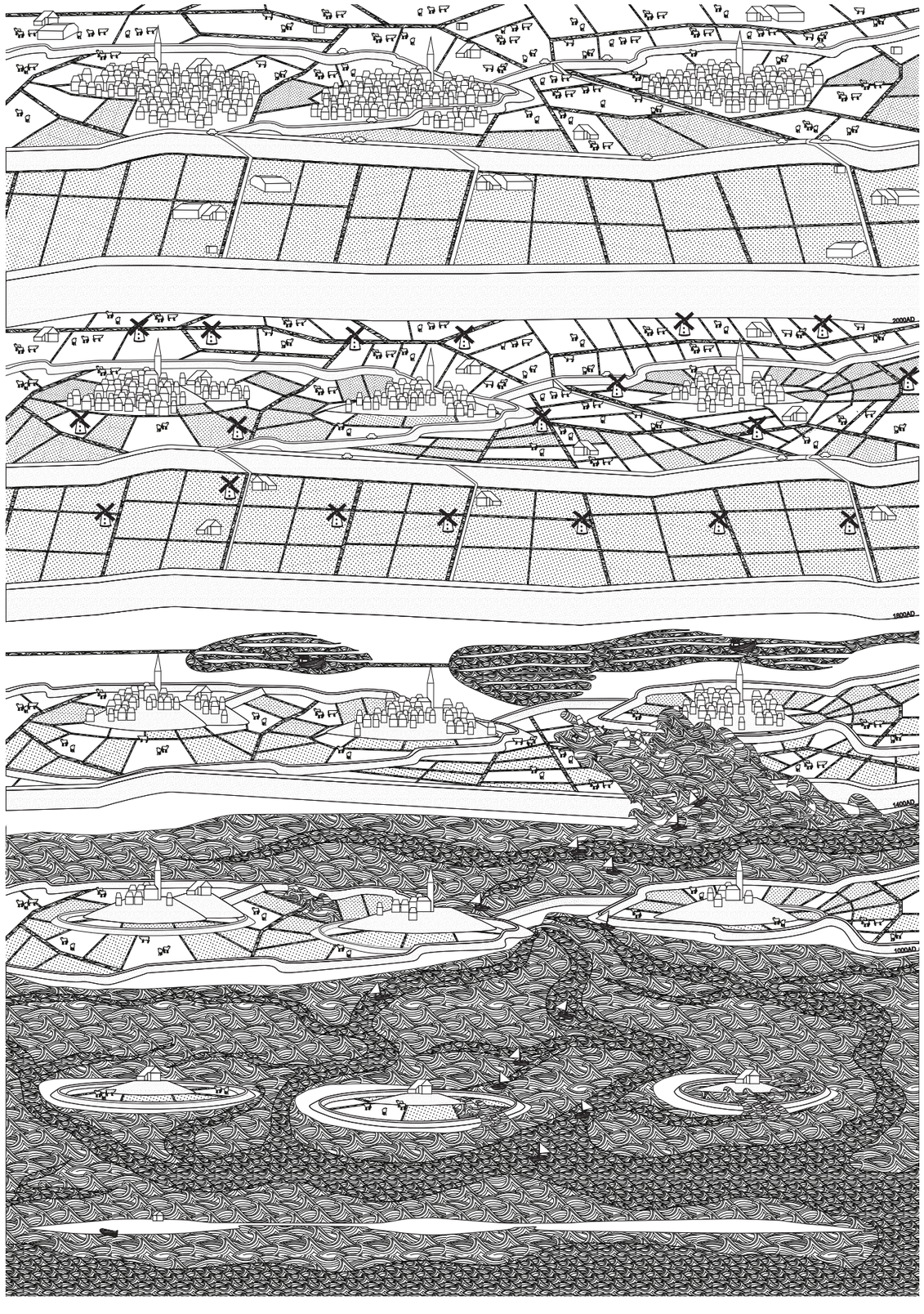
STATE OF THINKING

The perception of the border has changed in time

Inspiration?



(Own library)



2000 AD

1800 AD

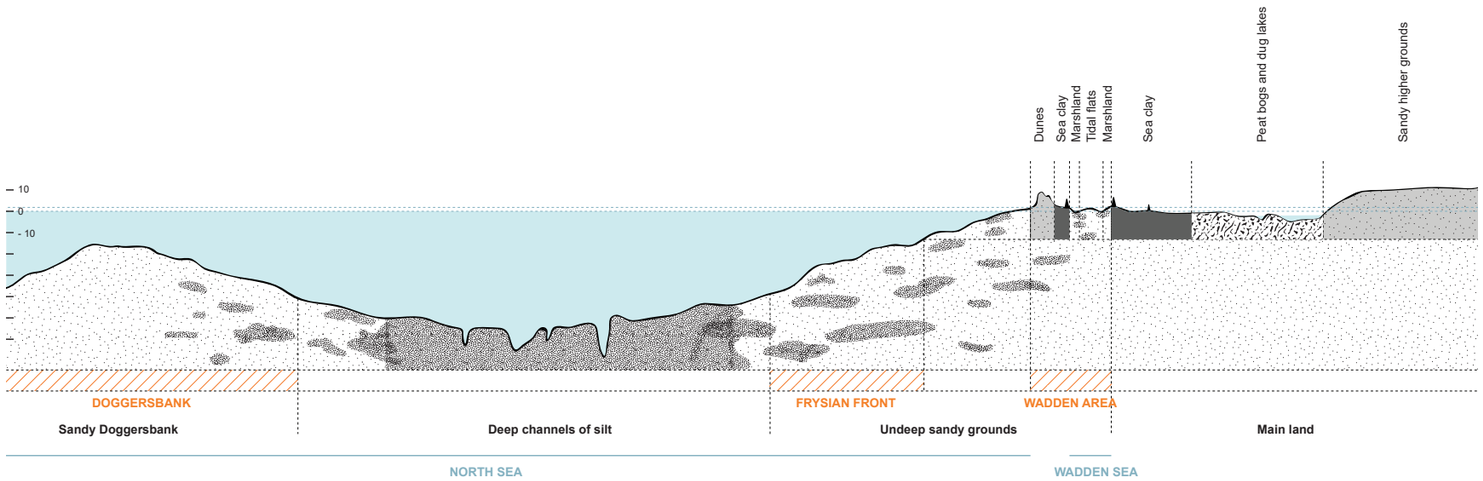
1400 AD

1000 AD

500 BC

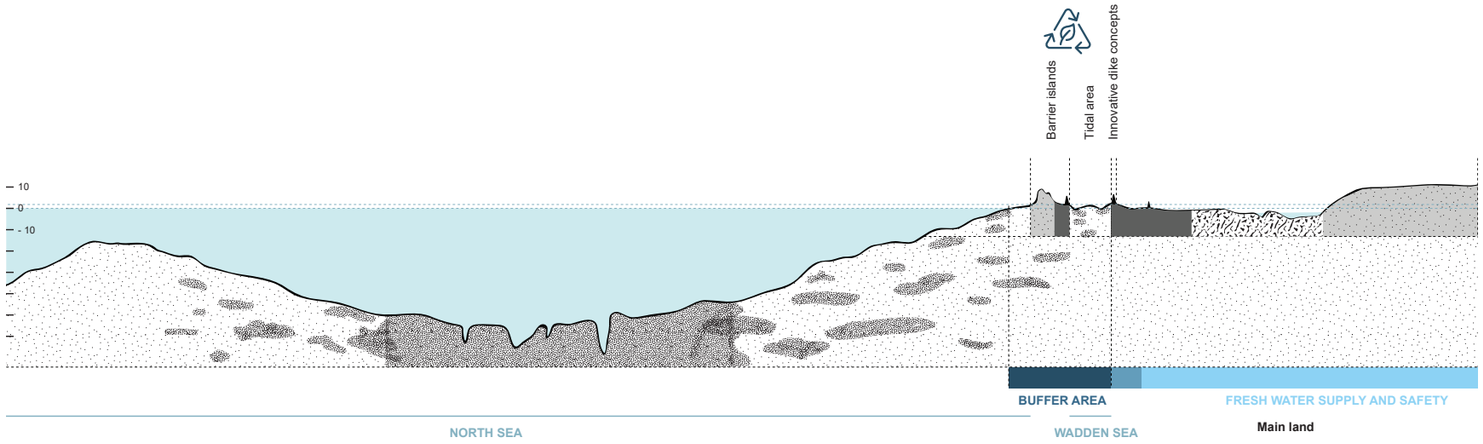
1000 BC

Strengthening ecological structure between Wadden area and main land: more ecological development along coastline



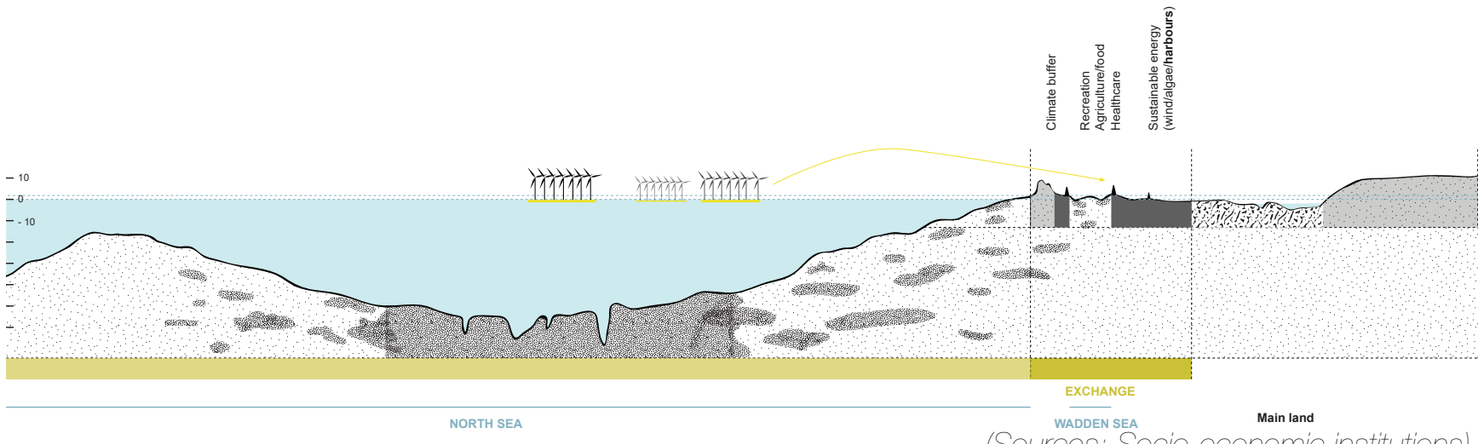
(Sources: Natura 2000, UNESCO, WWF, Waddenarea NL)

Climate-resistant buffer zone using natural processes and materials: integration of tidal patterns and deposition in borderscapes



(Sources: Deltaprogram main land and Wadden area)

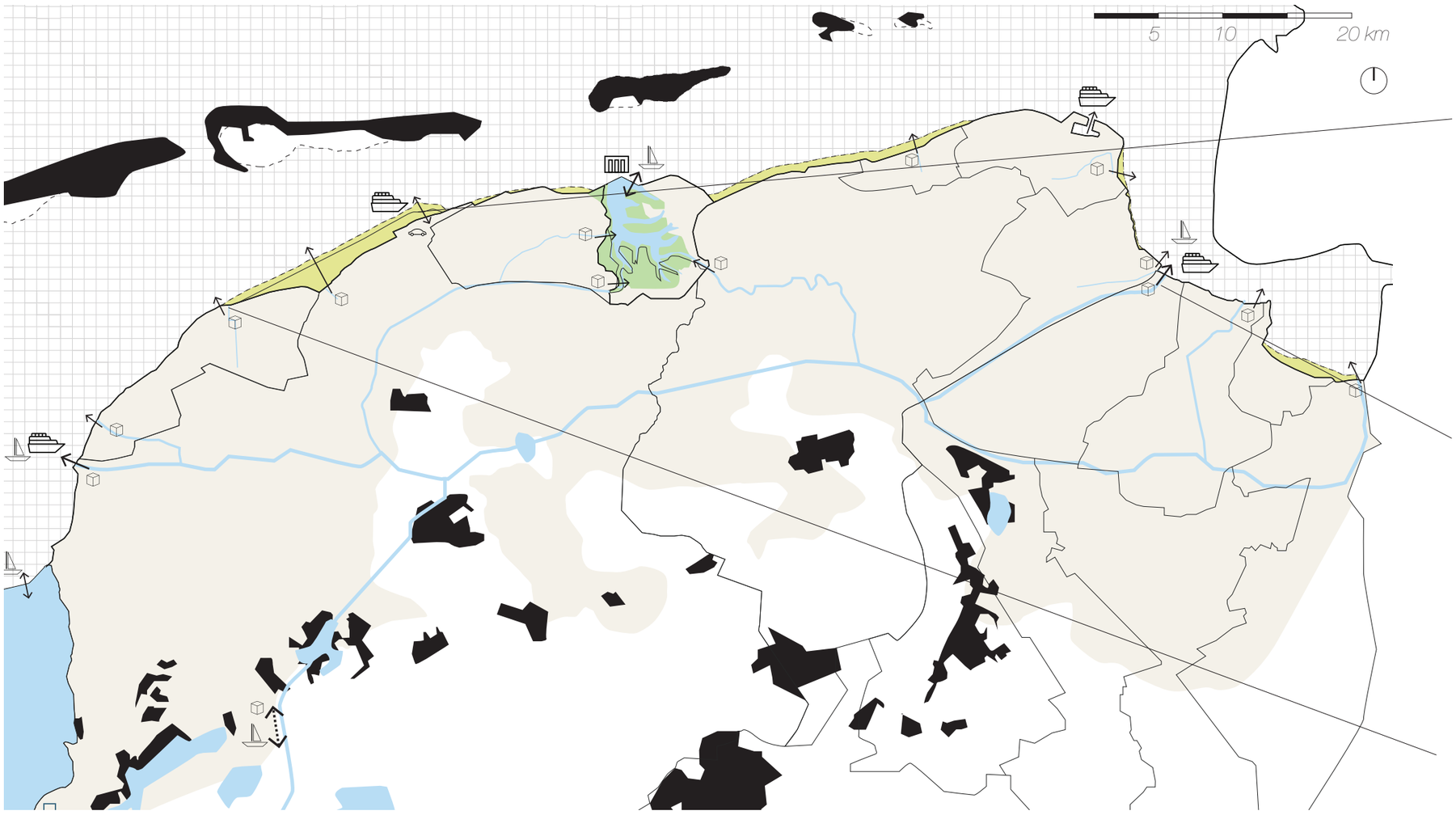
Sustainable energy and recreation ask for an (accessible) exchange between land and sea: harbours, new uses and structures



(Sources: Socio-economic institutions)

ANALYSIS OF POTENTIAL ZONES OF HIGHER PERMEABILITY

1. **Allow dynamics** - *Existing exchange as starting point; mapping different types*



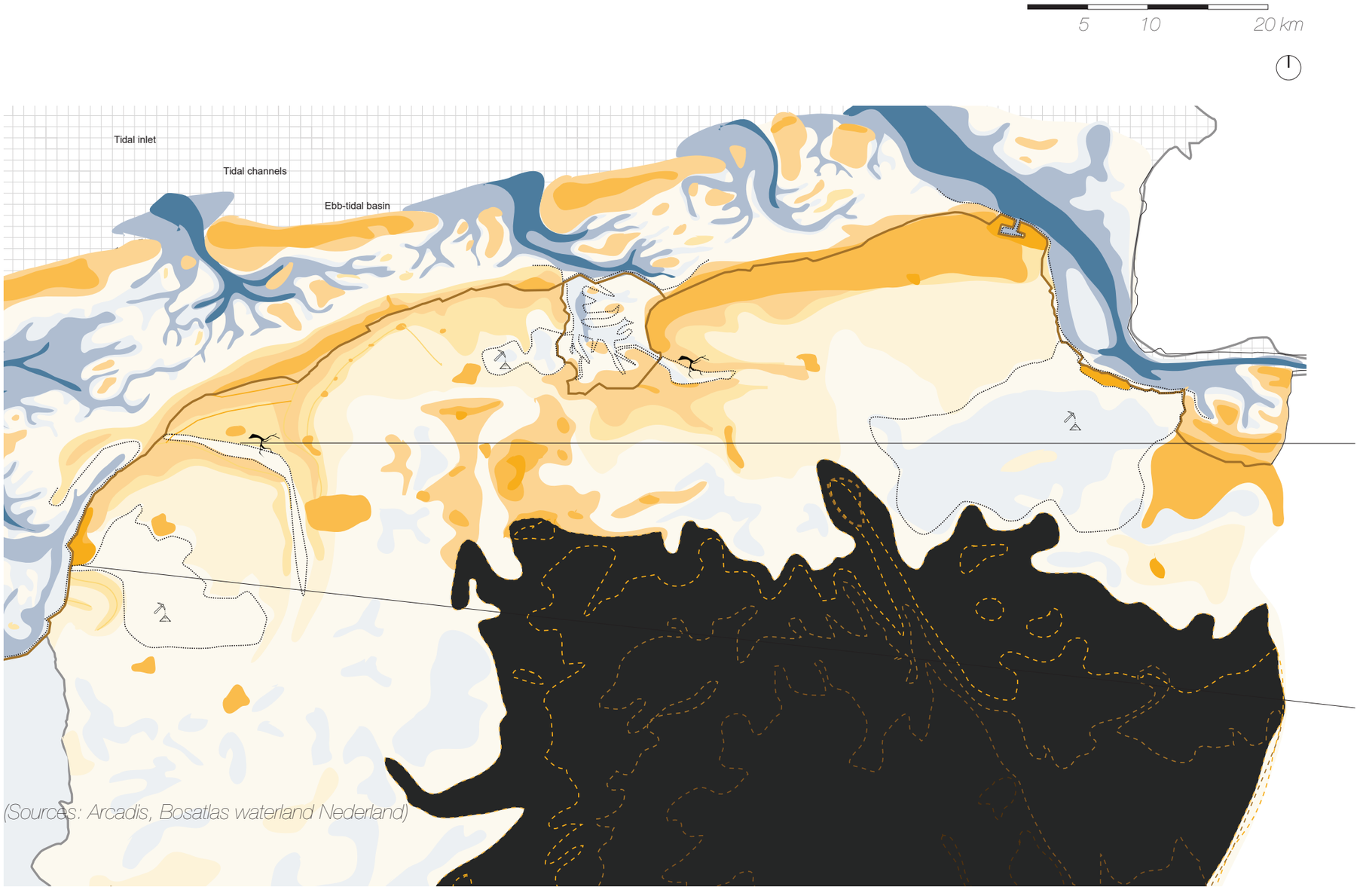
(Sources: Google maps, Bosatlas waterland Nederland)

Pier, Holwerd (Own library)

Harbour, Delfzijl (Google maps 2018)

Pumping station, zwarte Haan (Own library)

Allow dynamics - *Low topography on both sides as potential inlets as water flows with the least resistance*

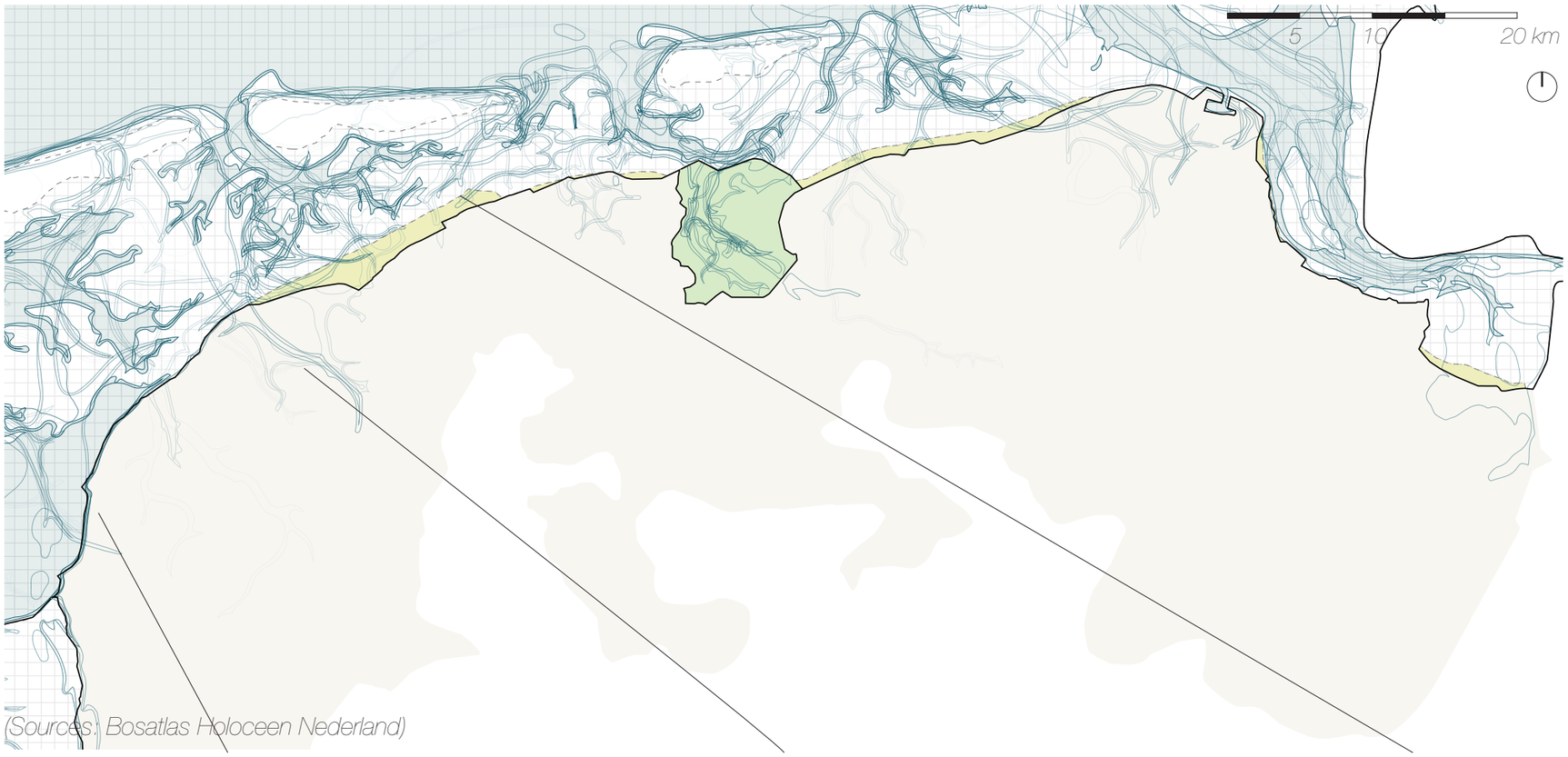


(Sources: Arcadis, Bosatlas waterland Nederland)

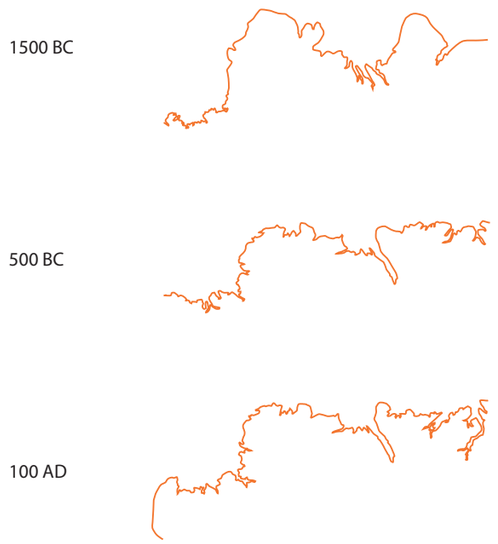
Cattle, Sint Annaparochie (Google maps)

Wetlands, Hegewiersterveld (Own library)

Allow dynamics - *Old sea arms can be seen as a potential for inlets or emphasizing gully patterns in the landscape*



(Sources: Bosatlas Holoceen Nederland)



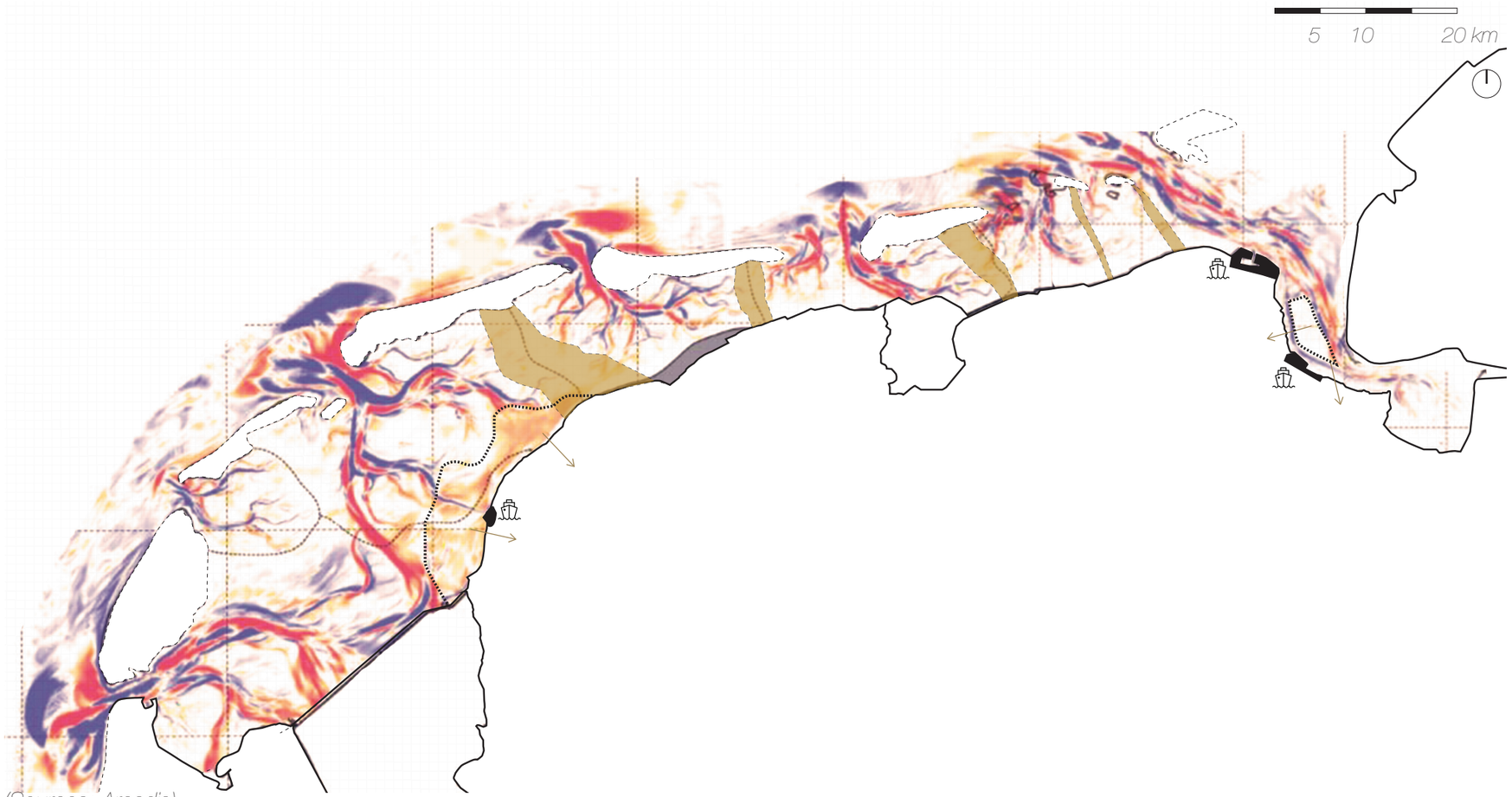
Shrinkage of coastal length (Sources: Bosatlas Holoceen)

Straight ditch (Own library)

Canalized gully (Own library)

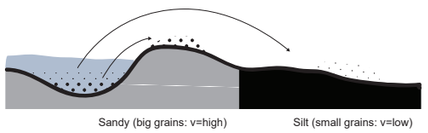
Tidal gully (Own library)

Allow dynamics - *Restore natural pattern of process of sedimentation and erosion by guiding it landinwards or where the tidal flows meet*



(Sources: Arcadis)

Natural sedimentation occurs where v=low

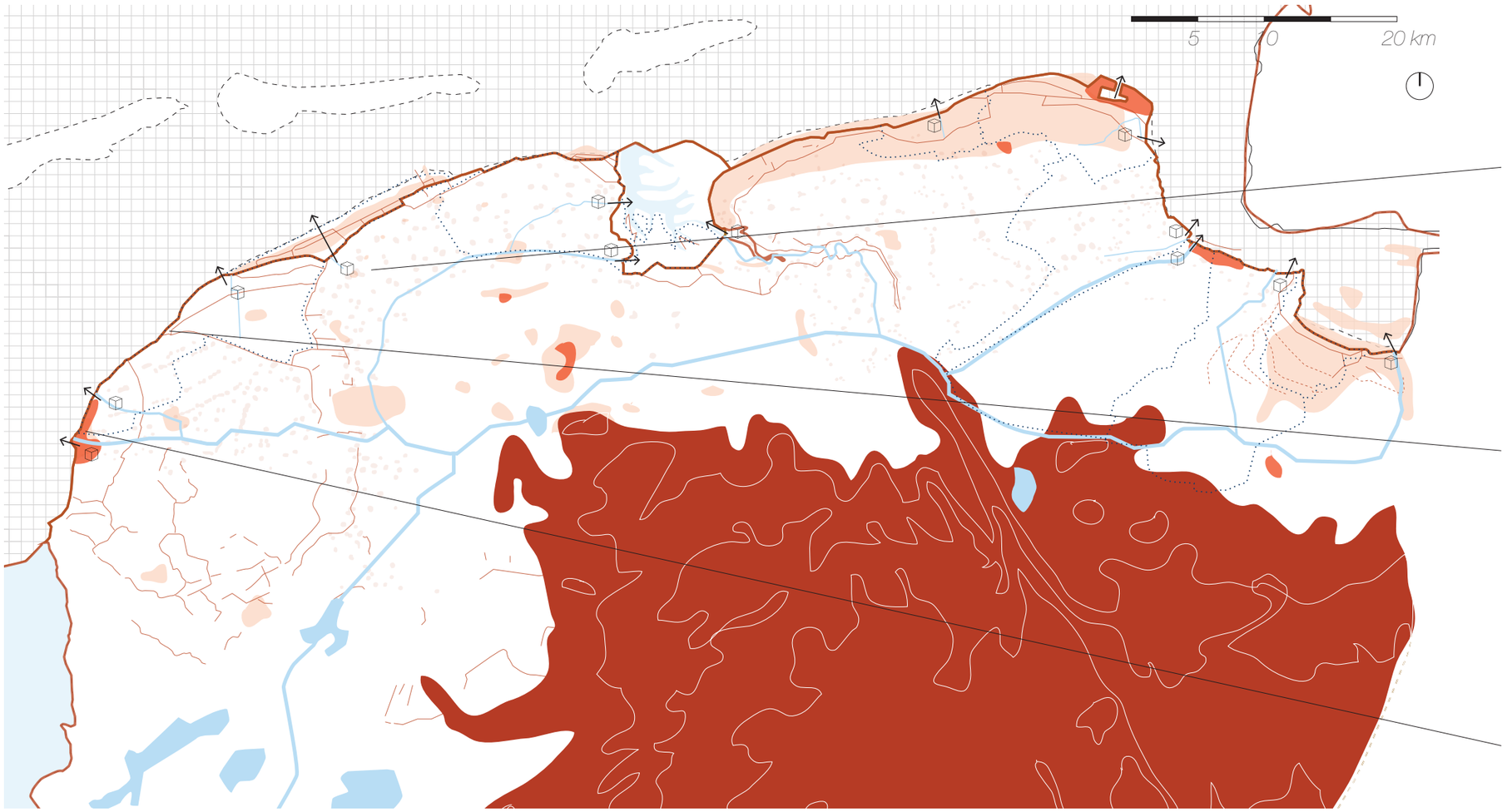


Deposition of soil type depends on velocity

Current division of fine and big grains

Potential zones of higher permeability - harbors, zones of low topography and pumping stations (inside the dike), zones inbetween tidals and pumping stations (outside dike)

Controlling elements - *Terps, dikes, harbour quays, watersystems*



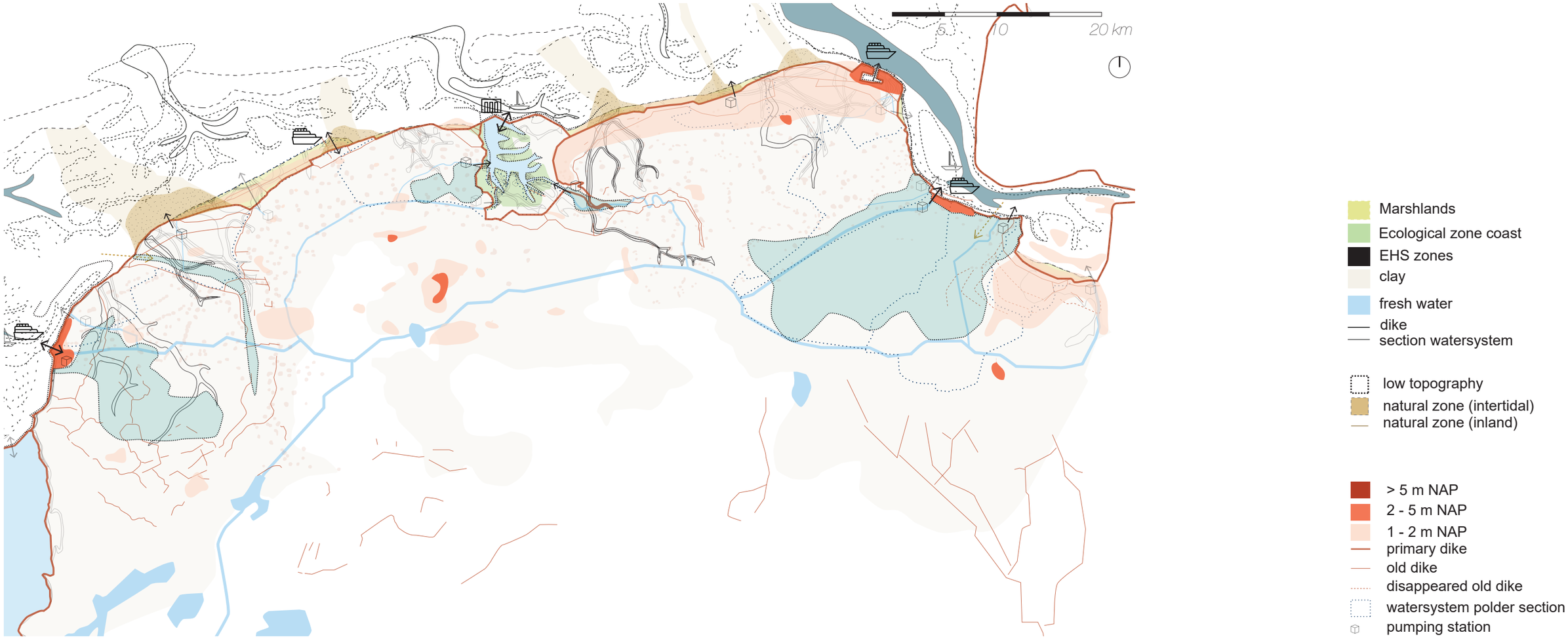
> 5 m NAP
2 - 5 m NAP
1 - 2 m NAP
primary dike
old dike
disappeared old dike
watersystem polder section
pumping station

Terps (Hegebeintum, Own library)

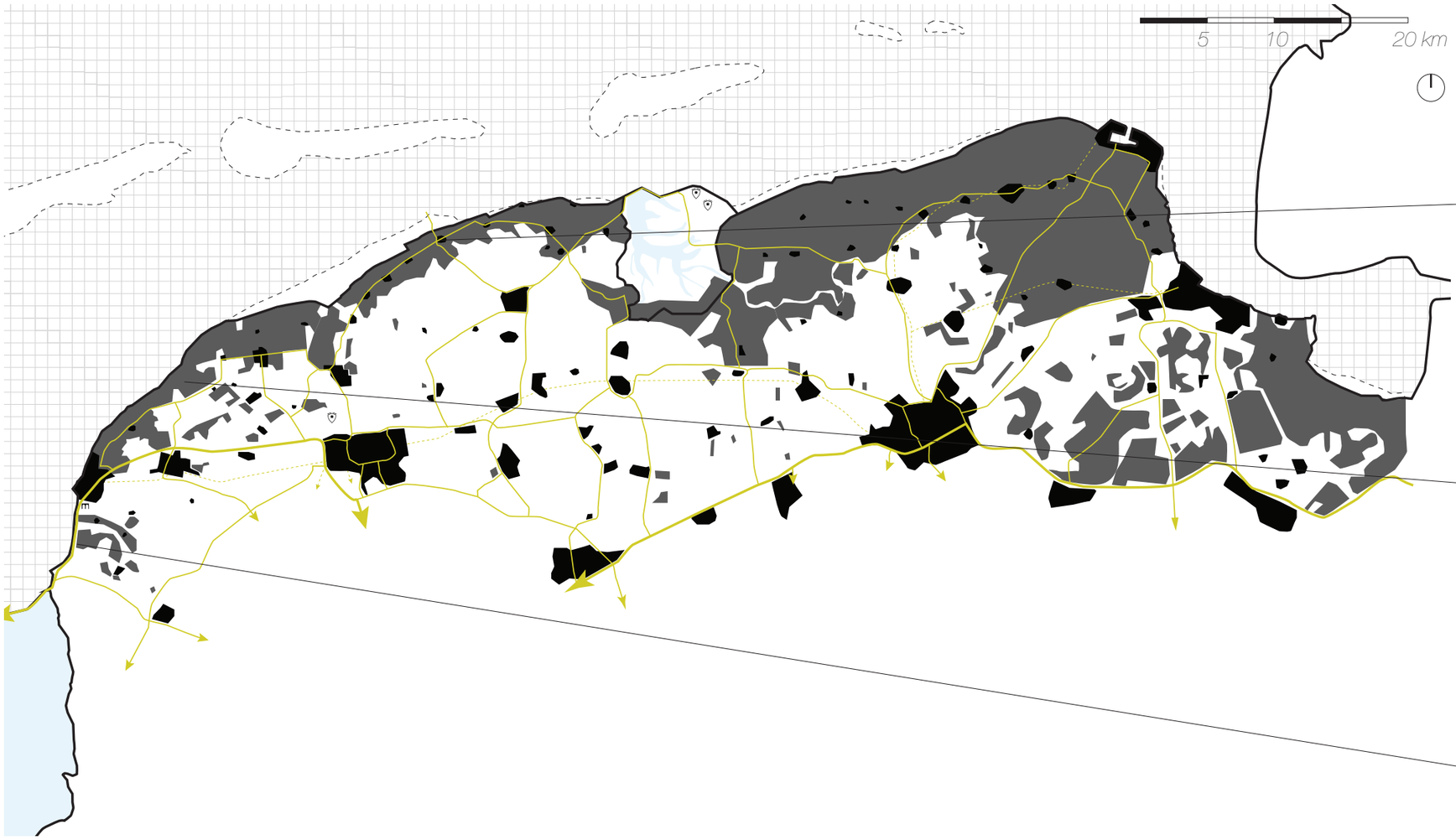
Old dikes (Dijkhoek, Own library)

Harbour quays (Harlingen, Own library)

Potential zones of higher permeability - overlap with controlling elements give different characteristics to the potential zones



Restrictions - *Production land, primary dike system, built environment, important roads*

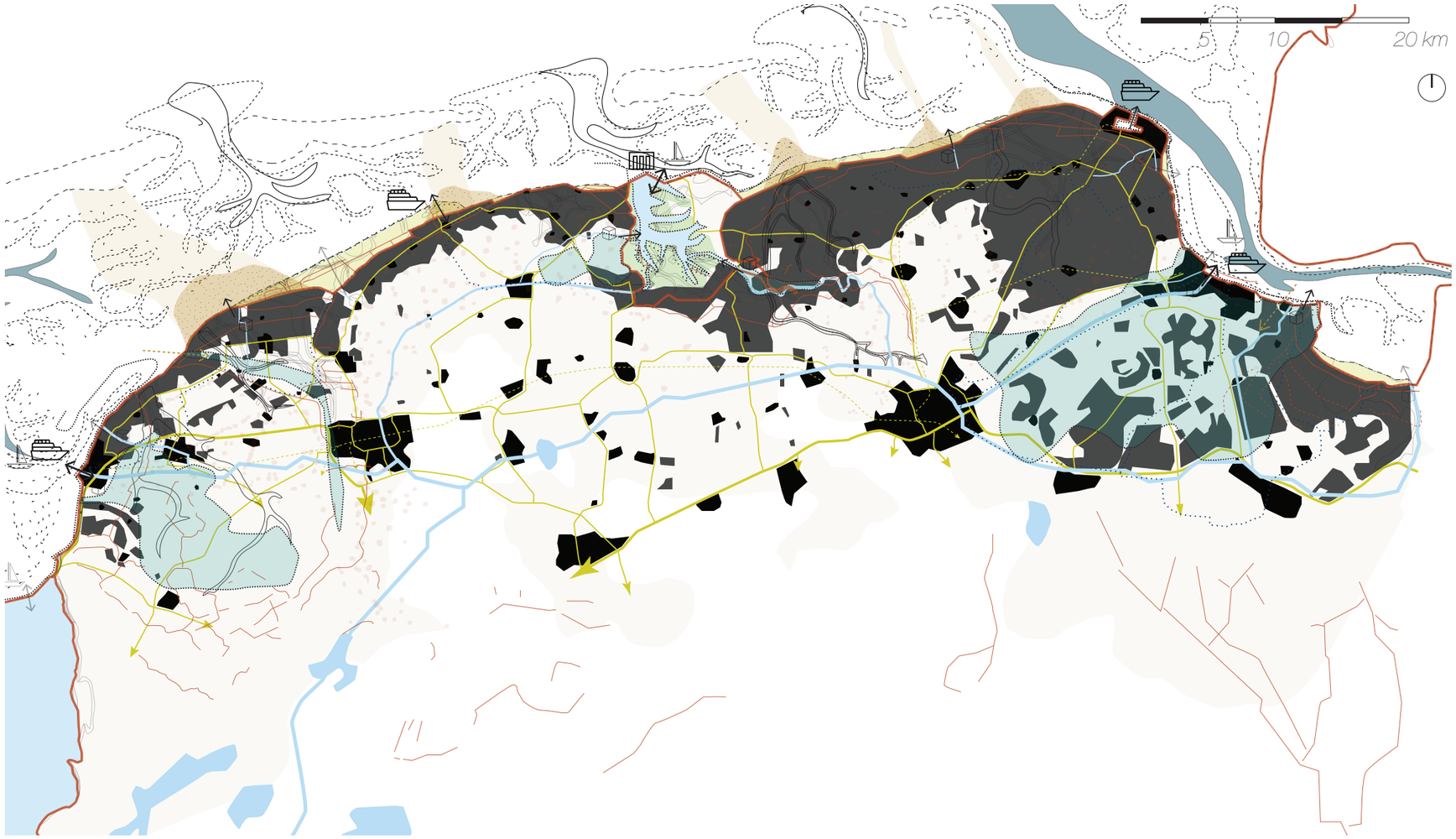


Built environment Holwerd (Own library)

Agriculture Dijkshoek (Own library)

N31 Harlingen (Own library)

Zones of potential and restriction - *Finding alternatives and mediating between potentials and conflicts*



built environment
production land
highway
motorway
railway
primary dike system

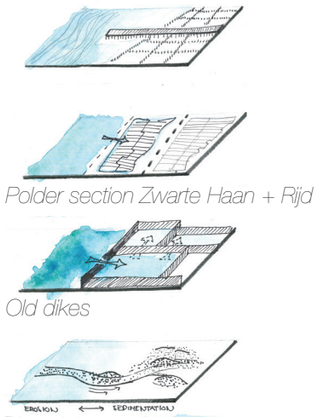
Marshlands
Ecological zone coast
EHS zones
clay

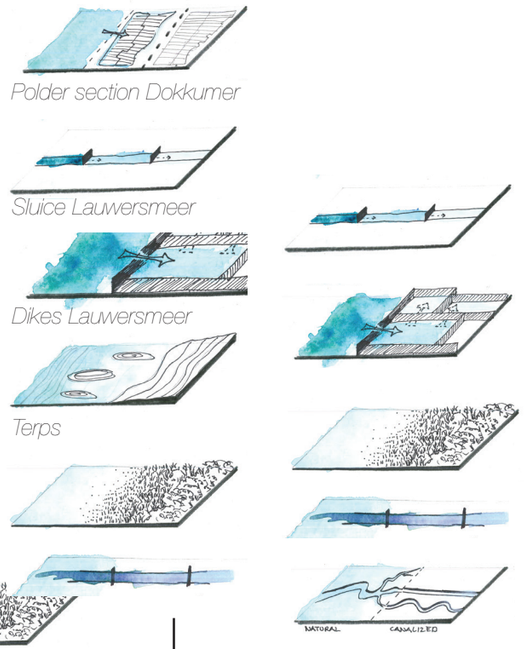
fresh water
dike
section watersystem

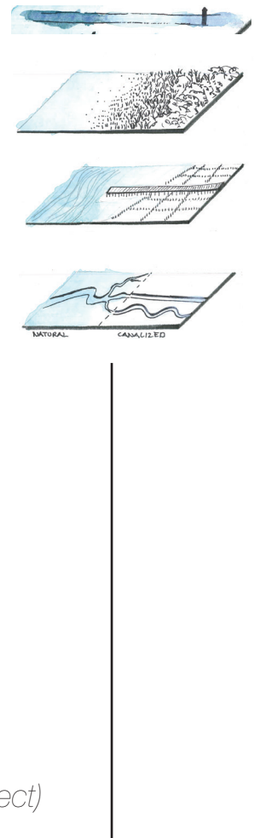
low topography
natural zone (intertidal)
natural zone (inland)

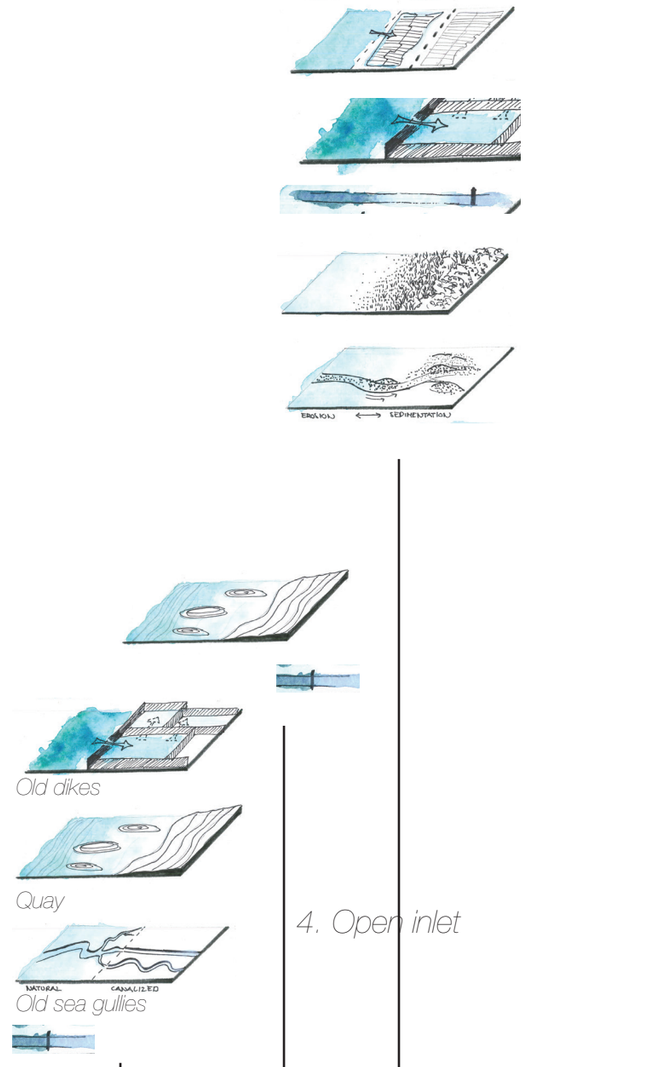
> 5 m NAP
2 - 5 m NAP
1 - 2 m NAP
primary dike
old dike
disappeared old dike
watersystem polder section
pumping station

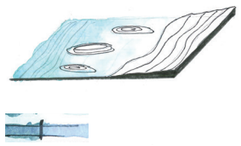
CATEGORIZATION POTENTIAL ZONES OF HIGHER PERMEABILITY

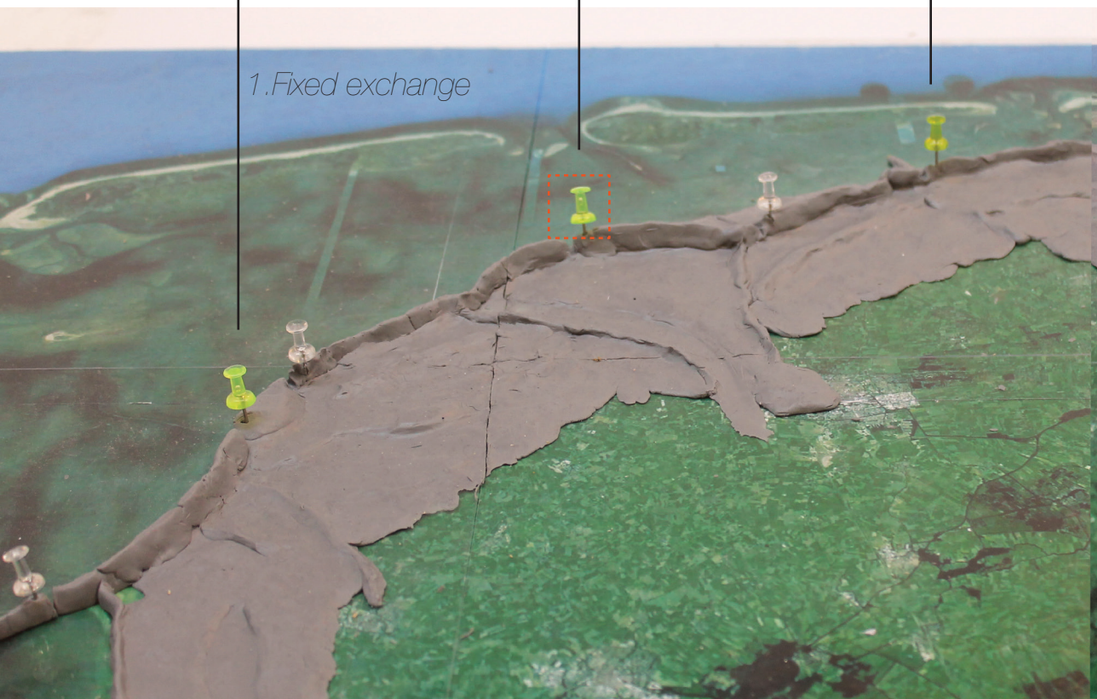










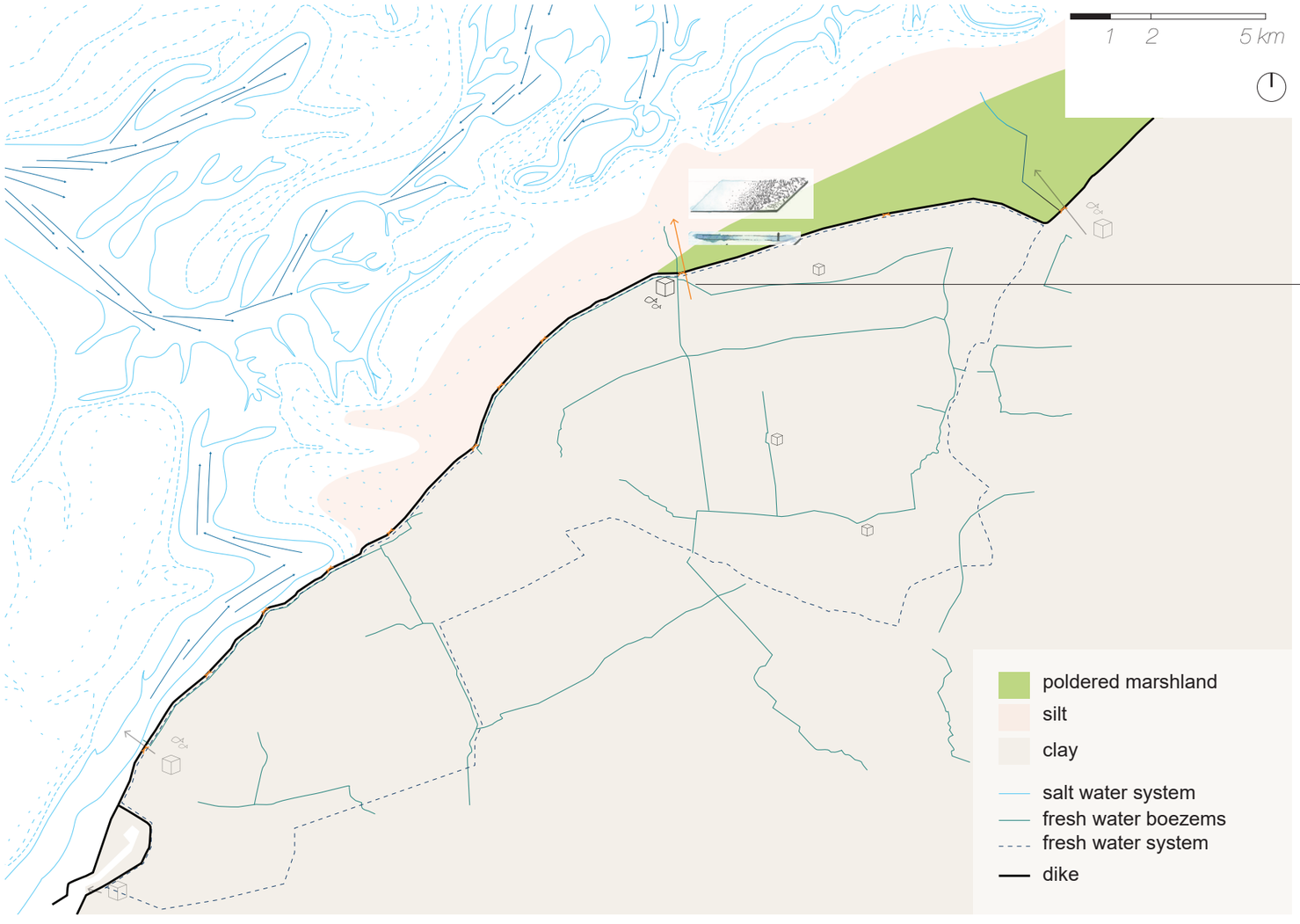


ANALYSIS TYPE 3. OLD SEA ARM (TO LEEUWARDEN)

Materialization, use and experience 'being on' Omringdijk (Field trip, december 2017, Own library)

Omringdijk painting early 20th century (Dirk Breed, 2018)

Allow dynamics - *Existing opening Zwarte Haan*



Infrastructural exchange (Own library all)

Two sides seawards, two uses

Viewing platform seawards

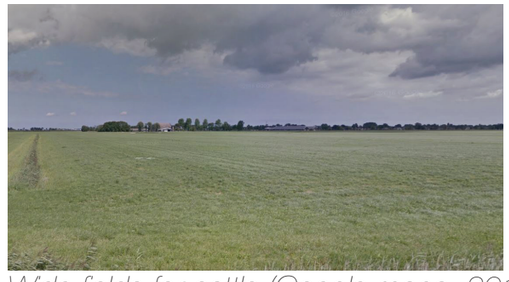
Fences on the dike give low accessibility

Viewing platform of pumping station landwards

Straight inland ditch with small public path

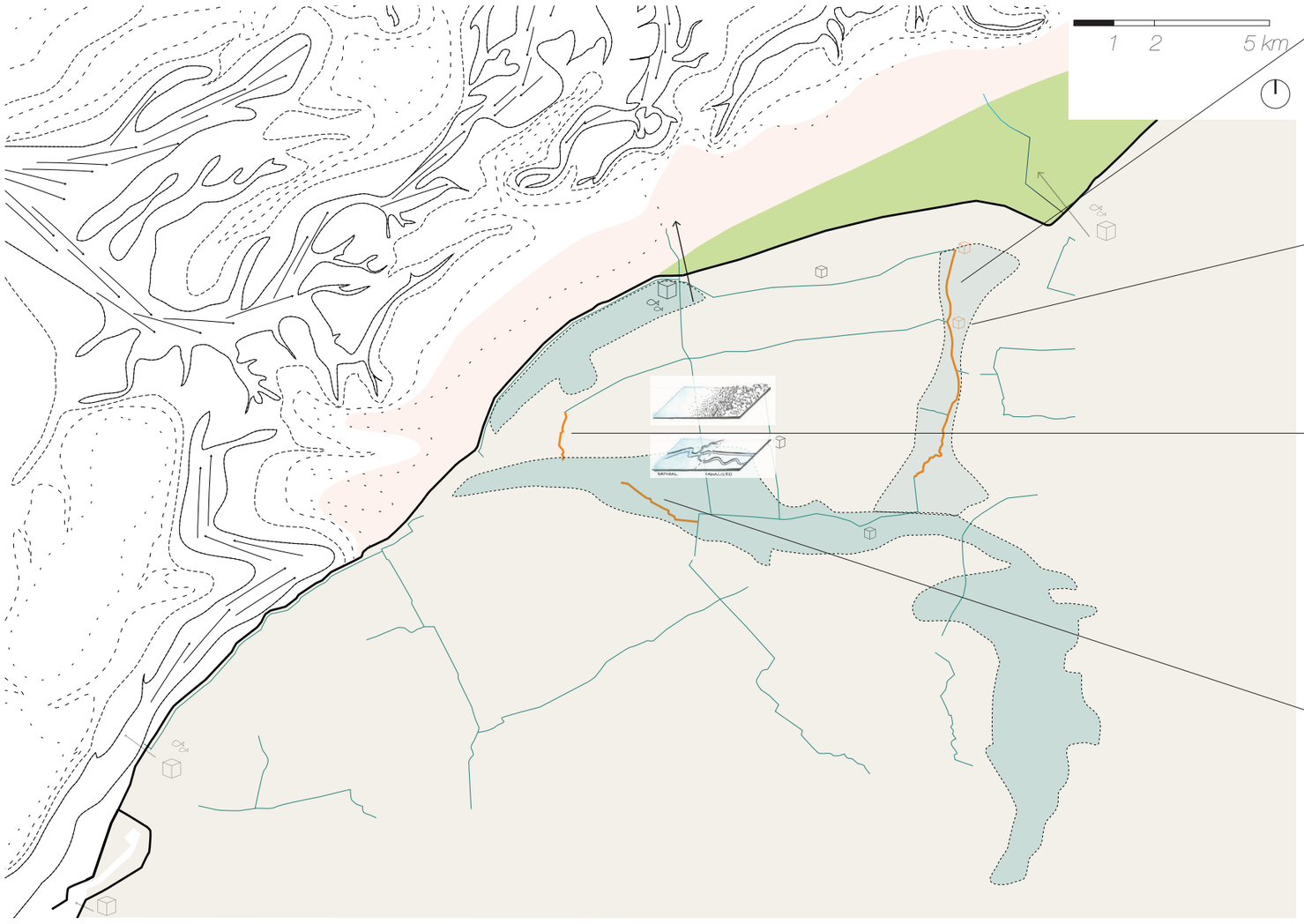
Allow dynamics - *Low topography of old sea gullies*

Wide fields for cattle (Google maps, 2018)



Wide fields for cattle (Google maps, 2018)

Allow dynamics - *Old sea gullies and potential public use*



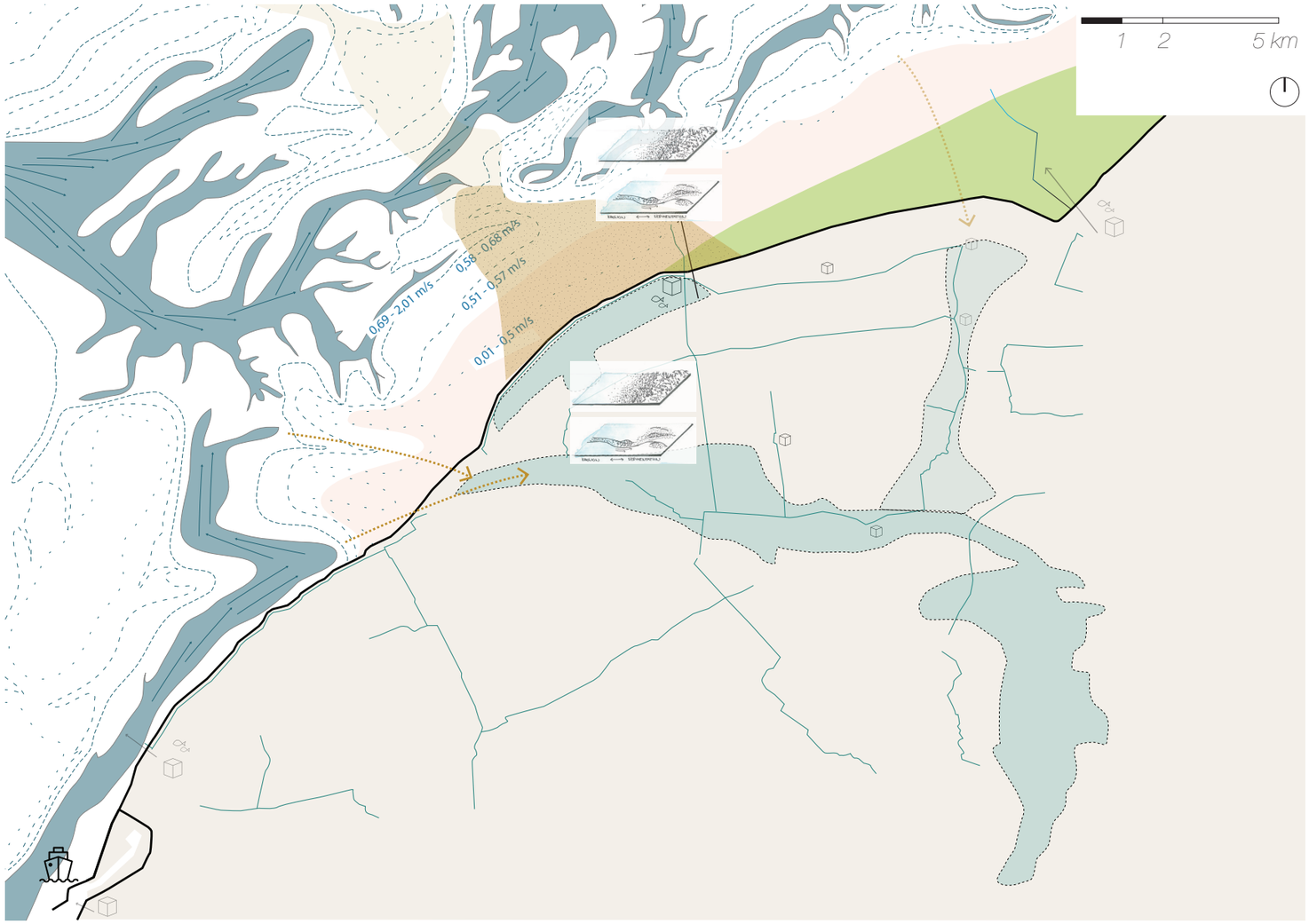
Along rural road, Ouwe Rij (Google Maps, 2018)

Built area, Ouwe Rij (Google Maps, 2018)

Parcel seperation, Holle Rij (Own library, 2017)

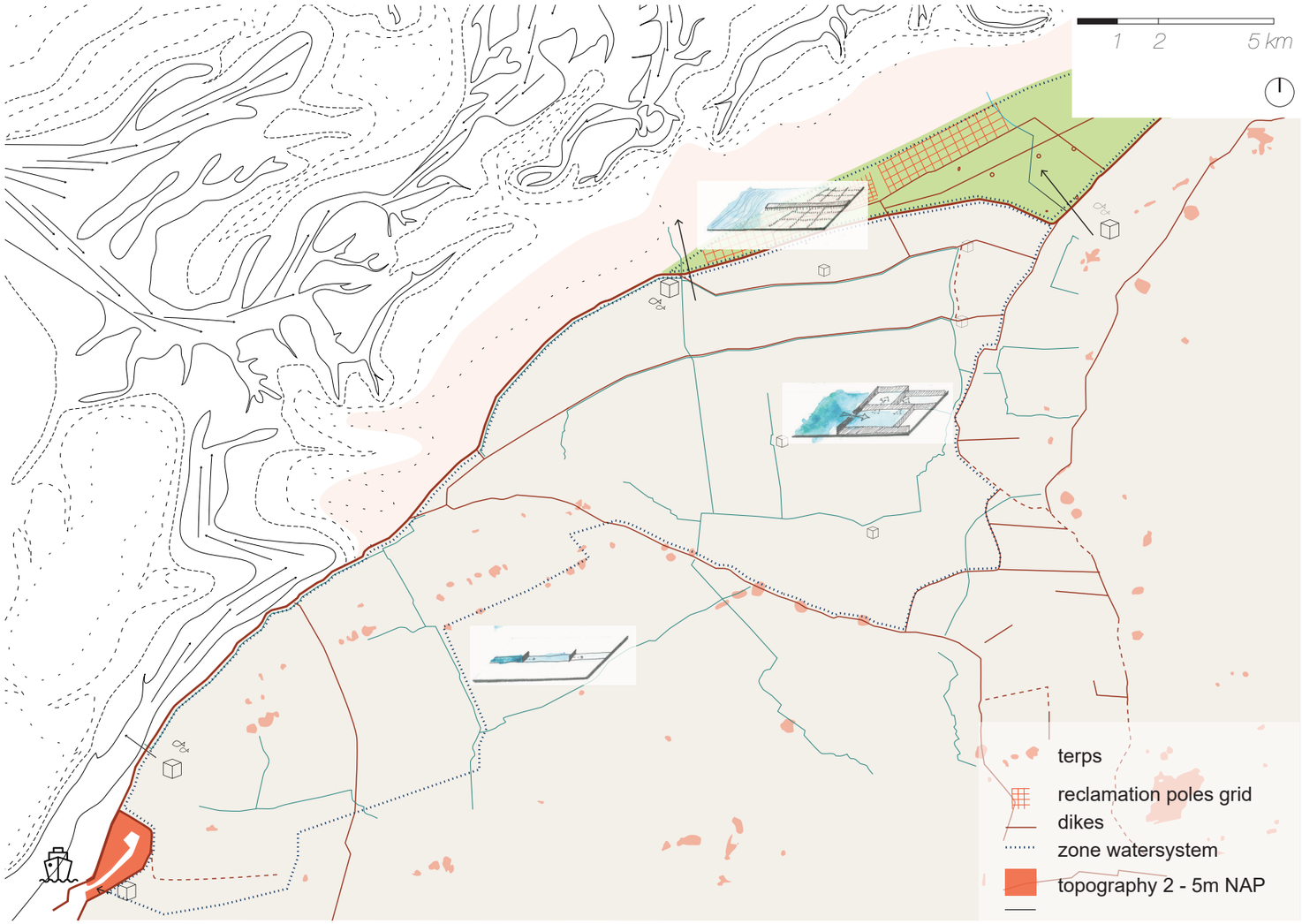
Recreation, Klaine Blikfaart (Google Maps, 2018)

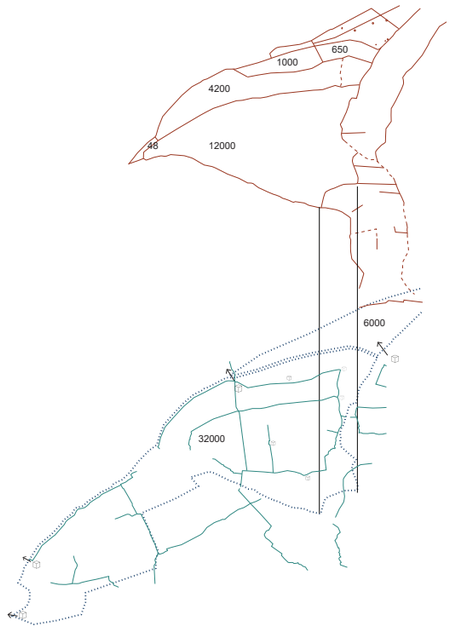
Allow dynamics - *Use natural zones of sedimentation*



- poldered marshland
- silt
- clay
- salt water system
- fresh water boezems
- fresh water system
- dike
- low topography
- natural zone of sedimentation
- potential zone of sedimentation

Controlling elements - *Dikes, reclamation poles, watersystem and pumping stations*





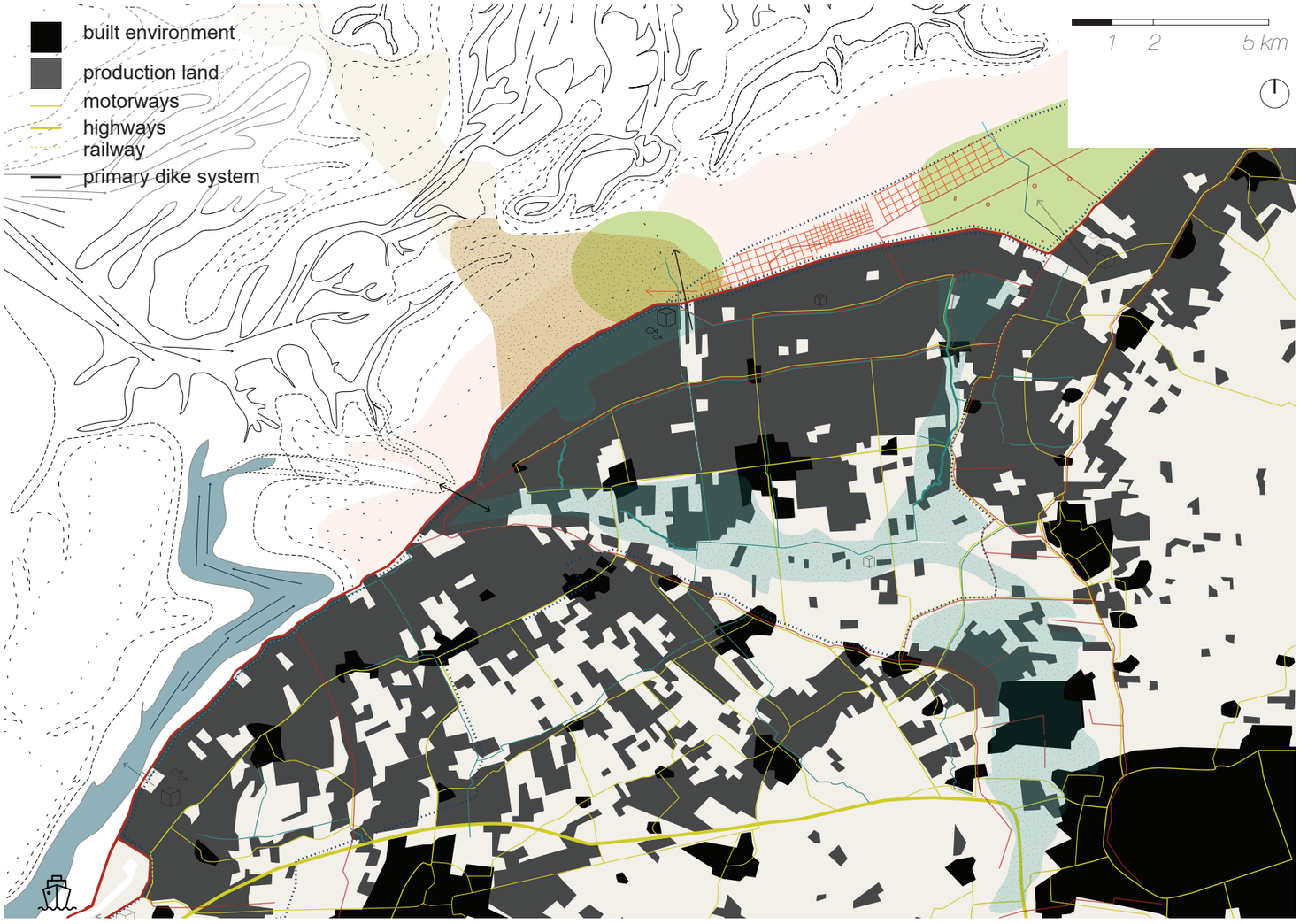
Size of zones of control and influence (in acres)

System of dikes, polder (Own library)

System of dikes, built area (Own library)

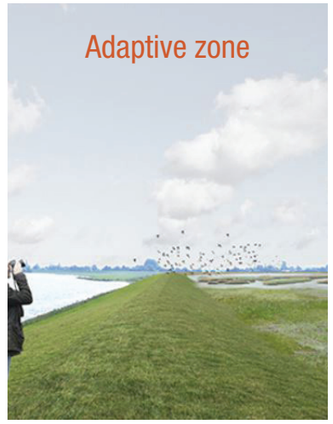
Grid of reclamation poles (Own library)

Potentials and conflicts - *4 sets of considerations*

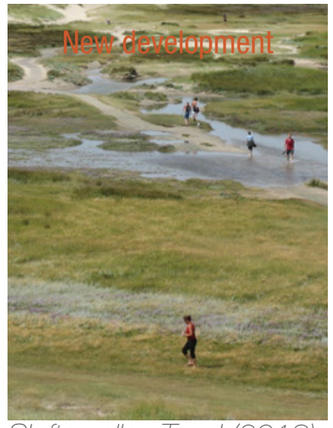


Potential

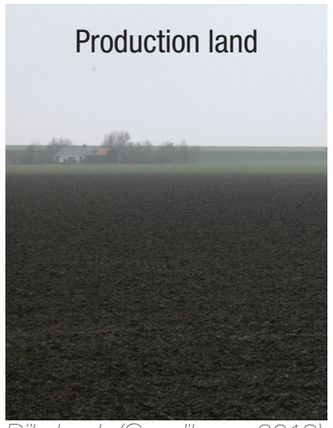
Conflict



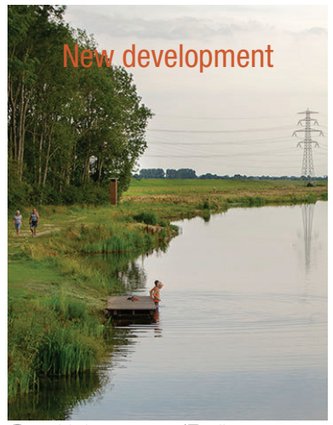
Research project open Afsluitdijk (LAMA architects, 2018)



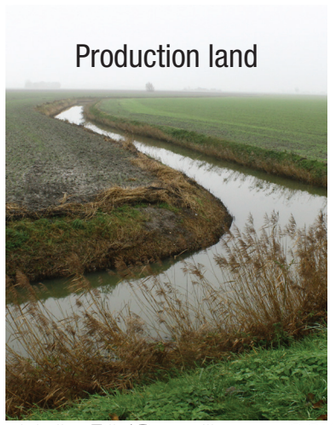
Sluftervalley Texel (2018)



Dijkshoek (Own library, 2018)

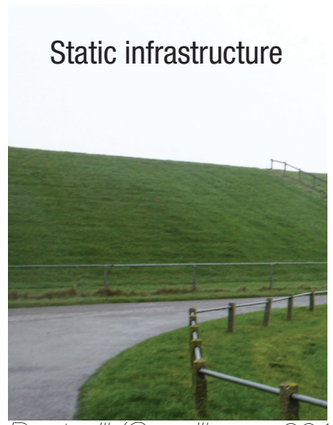


Geul Veessen (Baljon, 2018)



Holle Rij (Own library, 2018)

Omringdijk (Own library, 2018)



Roptazijl (Own library, 2018)

DESIGN TYPE 3. OLD SEA ARM TO LEEUWARDEN

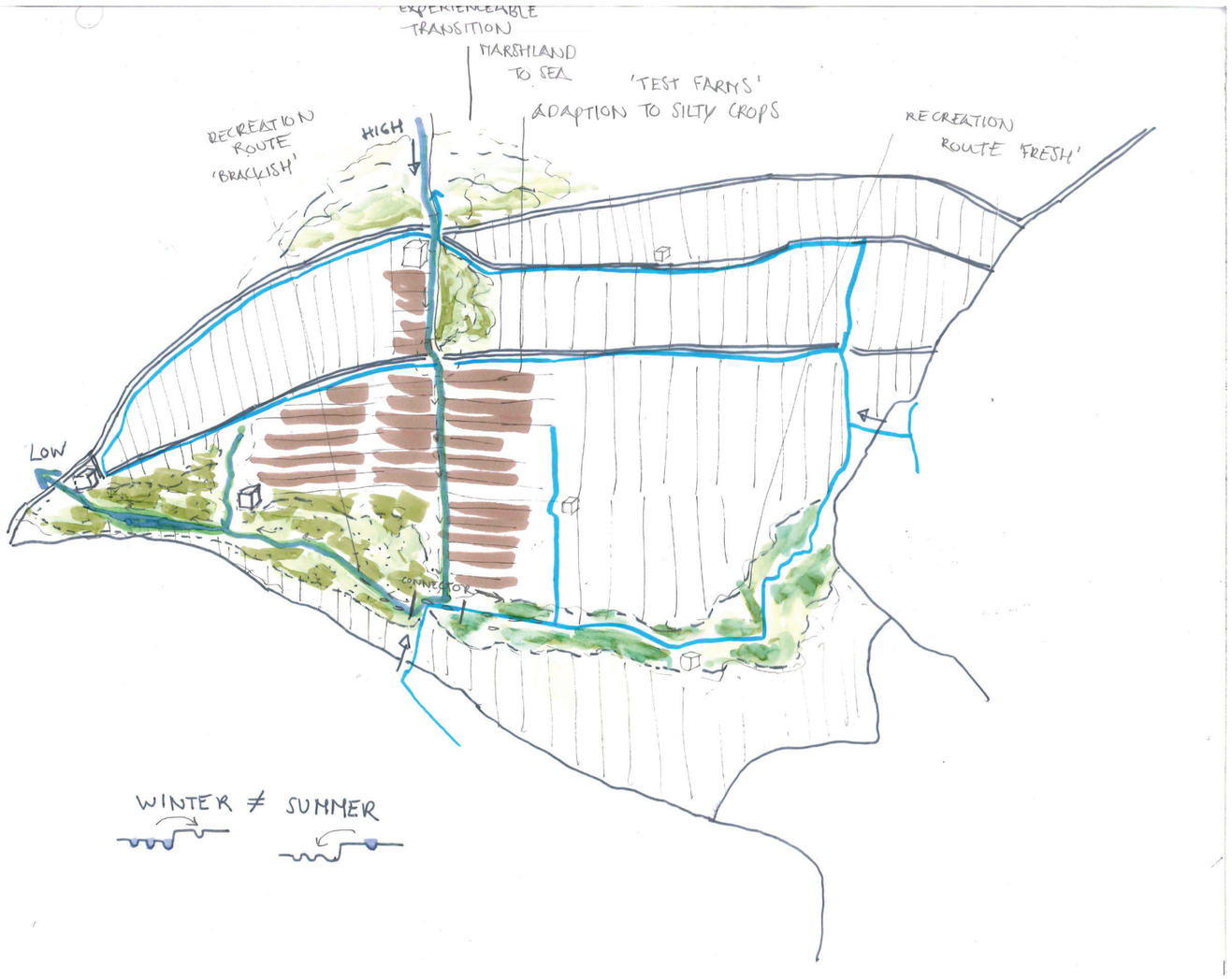
Design experiments - *Open inlet for adaptive capacity > Closed dike system*

Different basins, Hoogwatergeul Veessen (Baljon, 2018)

Tidal inlet, proposed project (LAMA, 2018)

DESIGN TYPE 3. OLD SEA ARM TO LEEUWARDEN

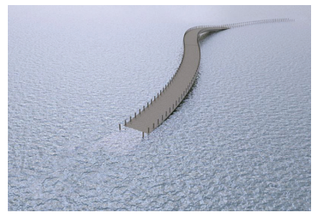
Design experiments - *New ecological development and human uses > Current production landscape*



Recreation, Hoogwatergeul Veessen (Baljon, 2018)

Alongside (Pier, Holwerd)

Being 'in' (Pier, Thames)



Experiencing dynamics (Rivierpark Waal, 2018)

BORDERSCAPE

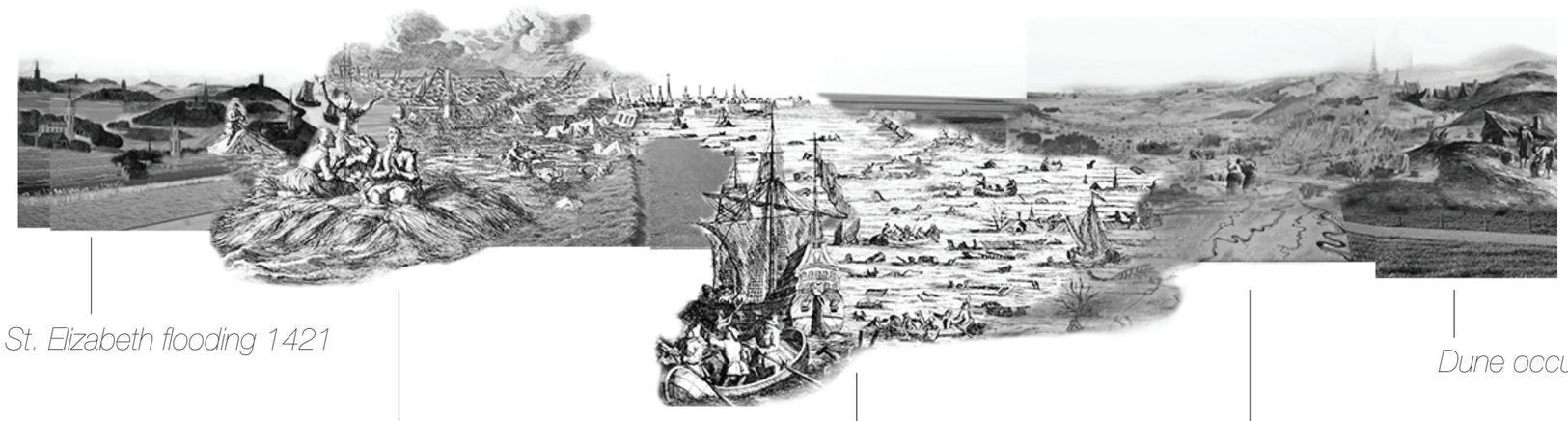
- *Increasing the level of permeability in between land and sea (at coastal Northern Netherlands)*

Marshland, Wadden sea area, Holwerd

"A coastal **borderscape** *is an living transition zone that connects land and sea. This zone supports different processes (land and sea) and human practises to pass and to interact; letting flows in and out selectively by being porous and resistant simultaneously. In time, the zone is getting nourished and is able to adapt in use, appearance, and permeability"*

(Sources: M. Eker, R. Sennett, M. Heidegger)

Historians: **The border between land and sea is dynamic full of human and natural processes**



St. Elizabeth flooding 1421

St. Lucia flooding 1287

Christmas flooding 1717

Sand-drift dunes 1500

Dune occupation 1700

Inhabitants/visitor: **The dike is an fixed wall of land not inviting to explore what is behind, it has always been like this**

"People have forgotten the existence of the sea under their feet. In time, the landscape pattern has been rationalized and systemitized. Many meandering gullies have been changed into straight ditches keeping the water level in the area controlled. Some gullies are still there in the landscape as private ownership serving only for functional purposes and leaving their identity unused".

"I drive with the dike on my side. Still, the distance between me and the dike does not become smaller as the monotonous open landscape and the endless roads parallel to it do not invite me to go towards it."

"Is the dike a private or public space? Different ownerships are marked by fences and hedges but it is unclear which is accessible for the public."

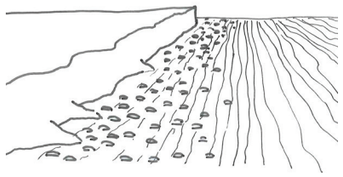
Taxonomy

Collage - Hunstanton, UK

Collage - *a palette of colors/ atmospheres as a result of different edges*
Abstraction - *earth work, top surface objects (land/edge/sea) and materiallization*
- *different widths by perception*

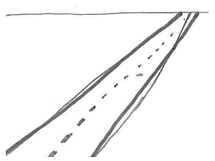
Abstraction

Earth work

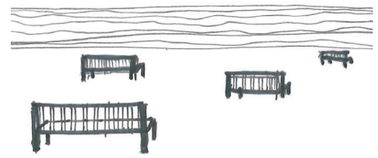


CLIFF

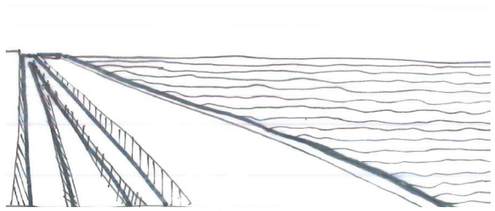
Top surface elements (land/edge/sea)



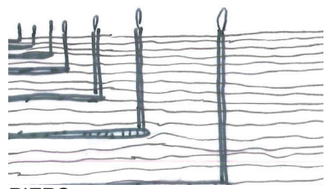
ROAD



GREEN VOID

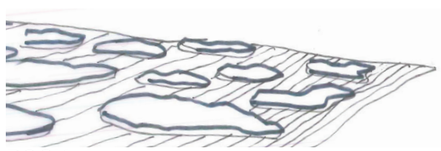


RAMP + BOULEVARD



PIERS

Materialization



ROCK

VEGETATION + ROCK

Taxonomy

Collage - Hondsbossche zeewering, The Netherlands

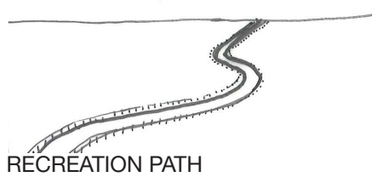
Abstraction

Earth work

DUNES

Top surface elements (land/edge/sea)

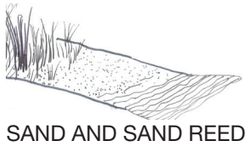
FIXED BUILDINGS



RECREATION PATH

FLEXIBLE BEACH PAVILLIONS

Materialization



SAND AND SAND REED