Nomadic Territories.

Reconceptualizing resilience in the Wadden Sea Region.
The experiment of Texel.

Ioanna Virvidaki
[4944224]

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Introduction

Introduction

Art & activism for climate change

Asmund Havsteen Mikkelsen (2018, Denmark) “Flooded Modernity”
Art installation - political statement
Le Corbusier’s Villa Savoye sinks in a Danish fjord

Retrieved from: https://www.wallpaper.com/art/flooded-modernity-le-corbusier-villa-savoy-vejle-museum

“Extinction Rebellion” activist group (2019, London, UK)
Climate change protest - political statement
Floating submerged replica of suburban house down the River Thames

Retrieved from: https://edition.cnn.com/2019/11/10/uk/london-floating-house-river-thames-intl-scli-gbr/index.html

Introduction

What is the humankind relation to the wider landscape and natural world?

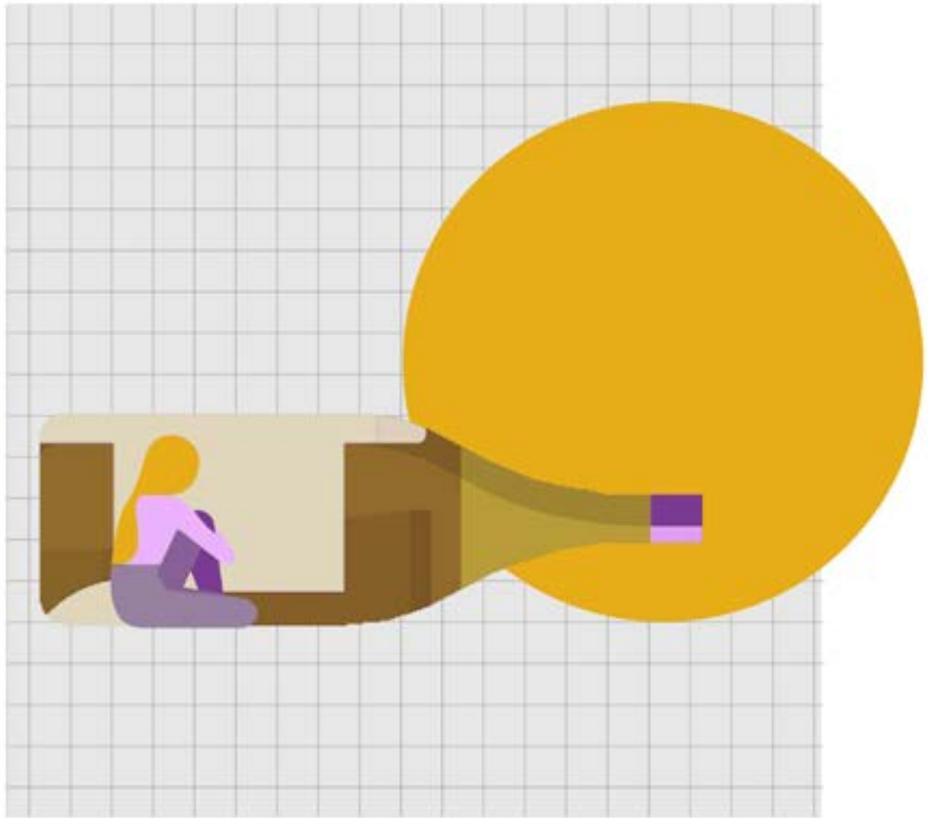
Antony Gormley, ANOTHER TIME
“man” iron sculpture exposed to extreme tides and natural elements
(exhibited from 2017 - 2020, Turner Contemporary, Margate, UK)

Retrieved from: https://twitter.com/haeckels_/status/899606980314230784

2

Nomadism

Nomadism
The body inside the bottle



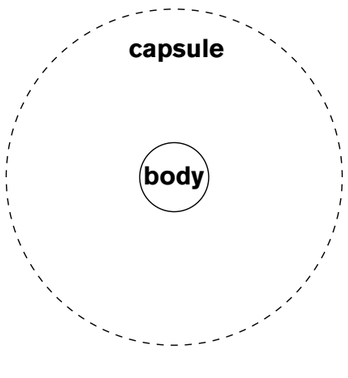
Nomad //ˈnəʊmad // noun
Noun: nomad; plural noun: nomads
from the Greek word **νομάς** – nomás, “roaming, wandering, especially to find pasture” –

Nomadism

Knowledge acquisition

First interpretation

Body = nomad
Bottle = capsule



Nomadism
Knowledge acquisition

First interpretation

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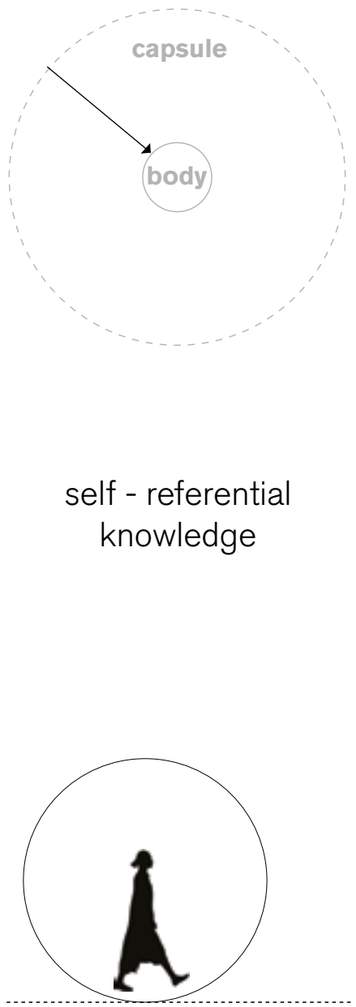

self - referential
knowledge

Nomadism

Knowledge acquisition

First interpretation

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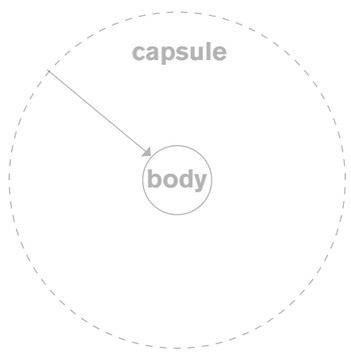
Bottle = capsule



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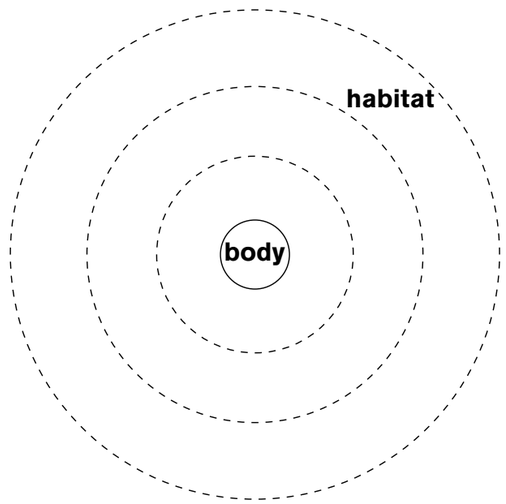
Second interpretation

Body = nomad
Bottle = habitat



self - referential
knowledge

Nomadism
Knowledge acquisition

First interpretation

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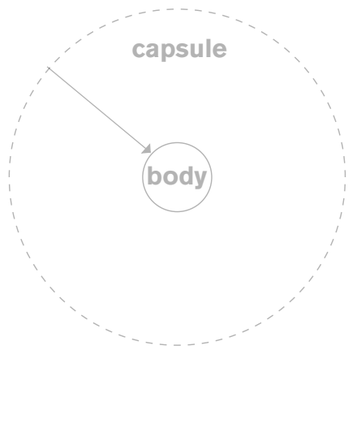

self - referential
knowledge

+

Second interpretation

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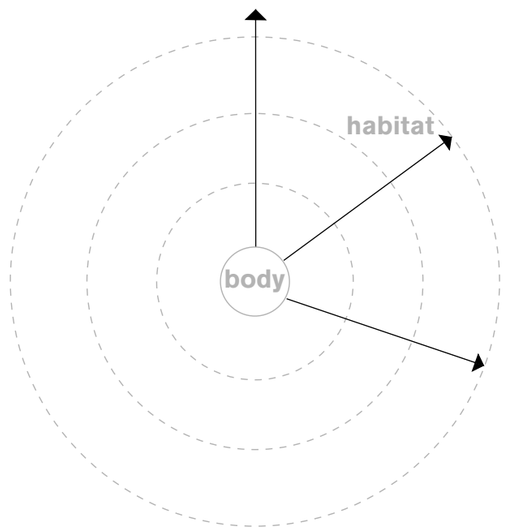
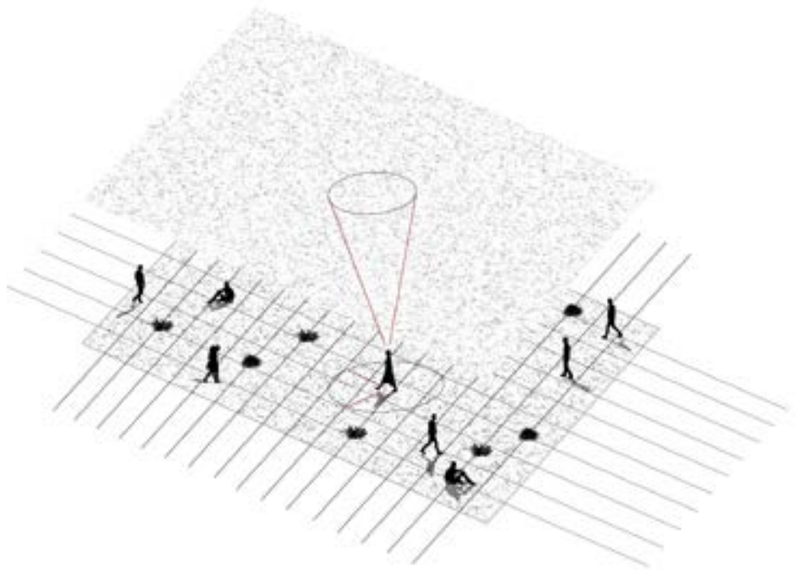


knowledge acquired by
“reading” the habitat

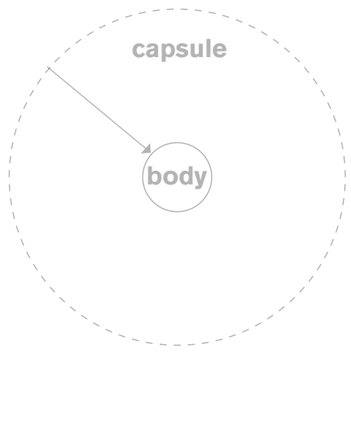


Nomadism

Knowledge acquisition & projection

First interpretation

Body = nomad
Bottle = capsule



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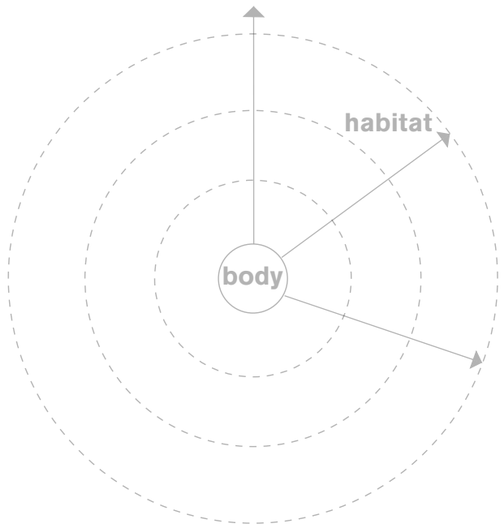
Second interpretation

Body = nomad
Bottle = habitat



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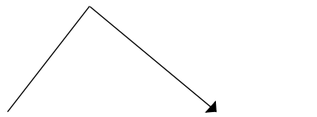
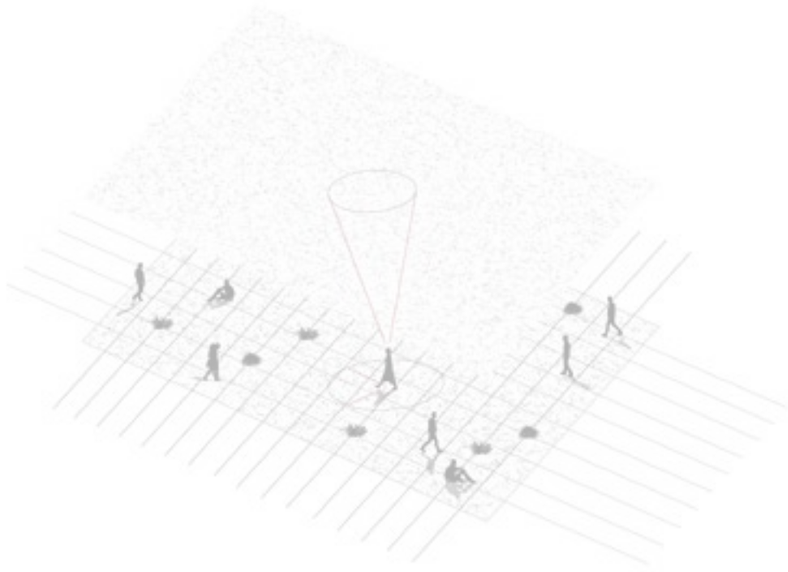


new topos

self - referential
knowledge

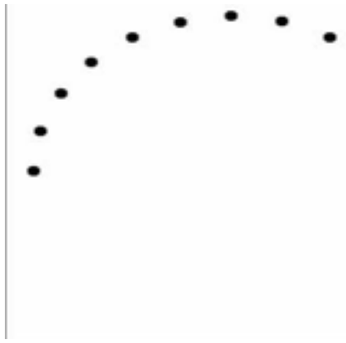
knowledge acquired by
“reading” the habitat



constant transition
territorialization | de - territorialization

Nomadism

Nomadic territories



nomadic territories -->territories in transition
in harmony with the ephemeral

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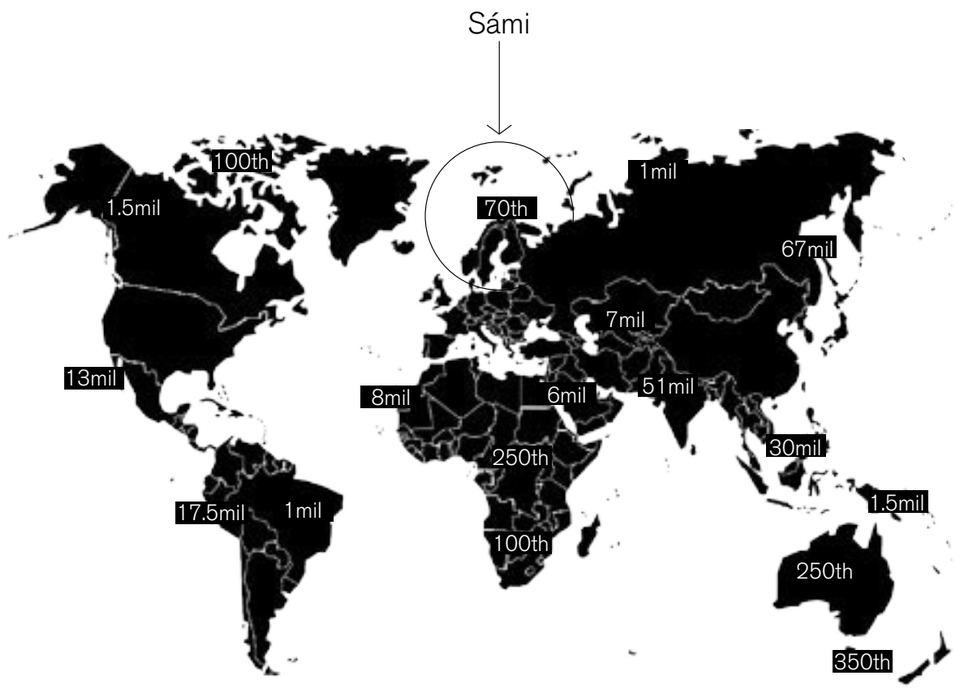
Ex ante Sámi

Ex ante Sámi

Who are they?



Nomadic and indigenous peoples around the world.

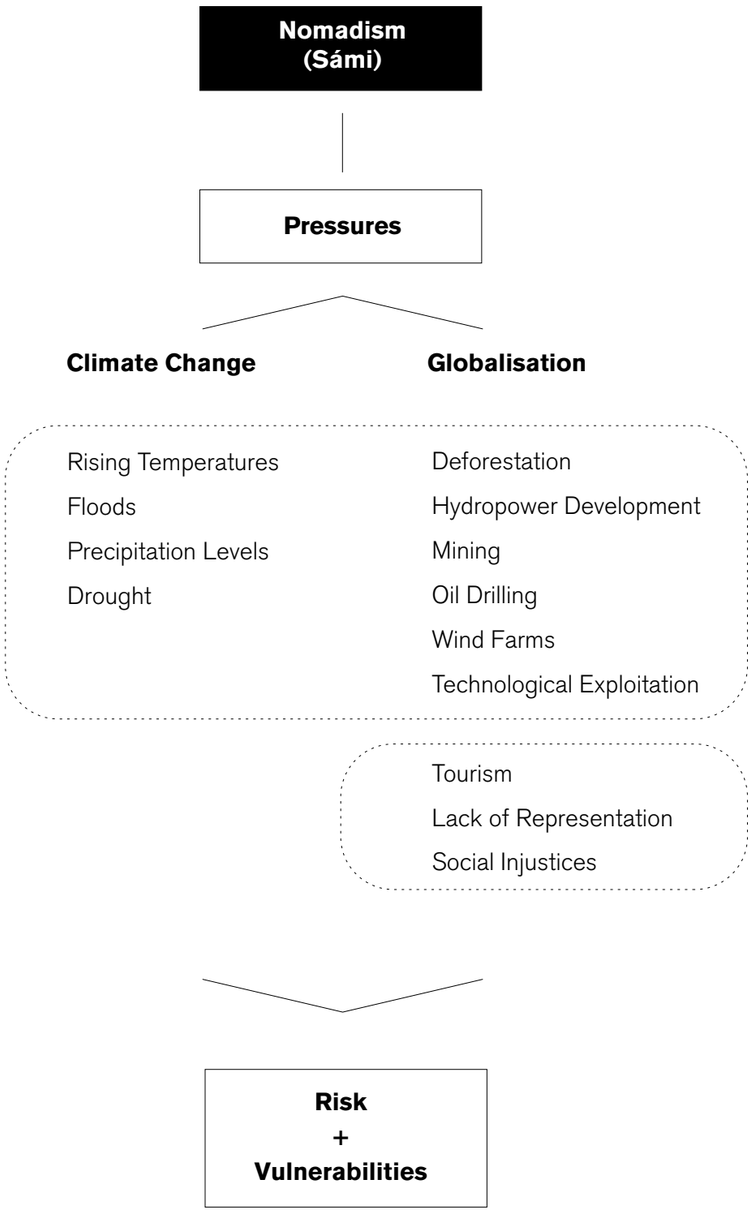
Retrieved from: http://www.samer.se/2137, edited by the author

Sámi herders.

Retrieved from: “girl”: https://ejfoundation.org/ | the rest: www.nordnorge.com

Ex ante Sámi

Problem statement



Ex ante Sámi

Problem statement

Nomadism (Sámi)

Pressures

Climate Change

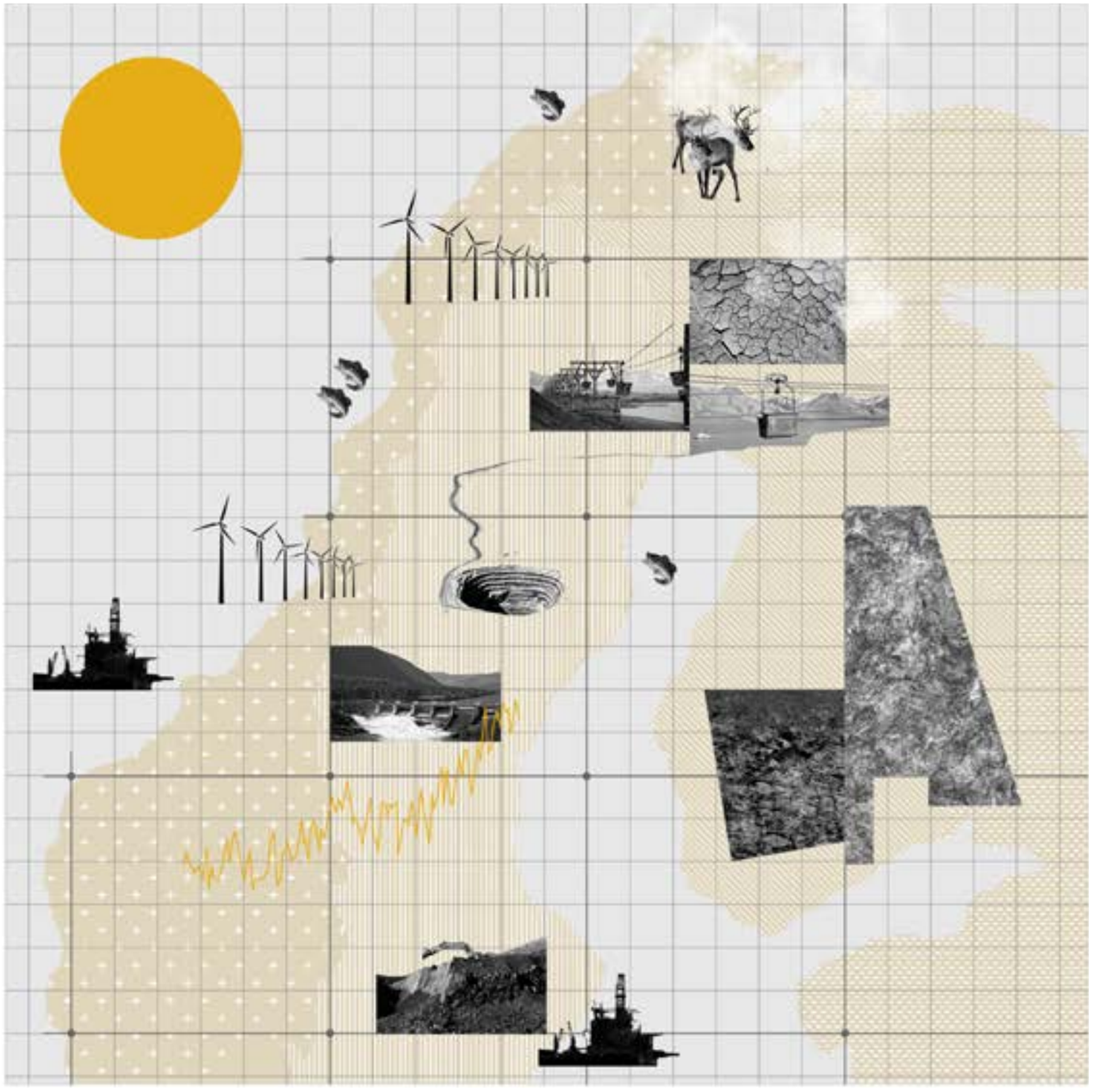
- Rising Temperatures
- Floods
- Precipitation Levels
- Drought

Globalisation

- Deforestation
- Hydropower Development
- Mining
- Oil Drilling
- Wind Farms
- Technological Exploitation

- Tourism
- Lack of Representation
- Social Injustices

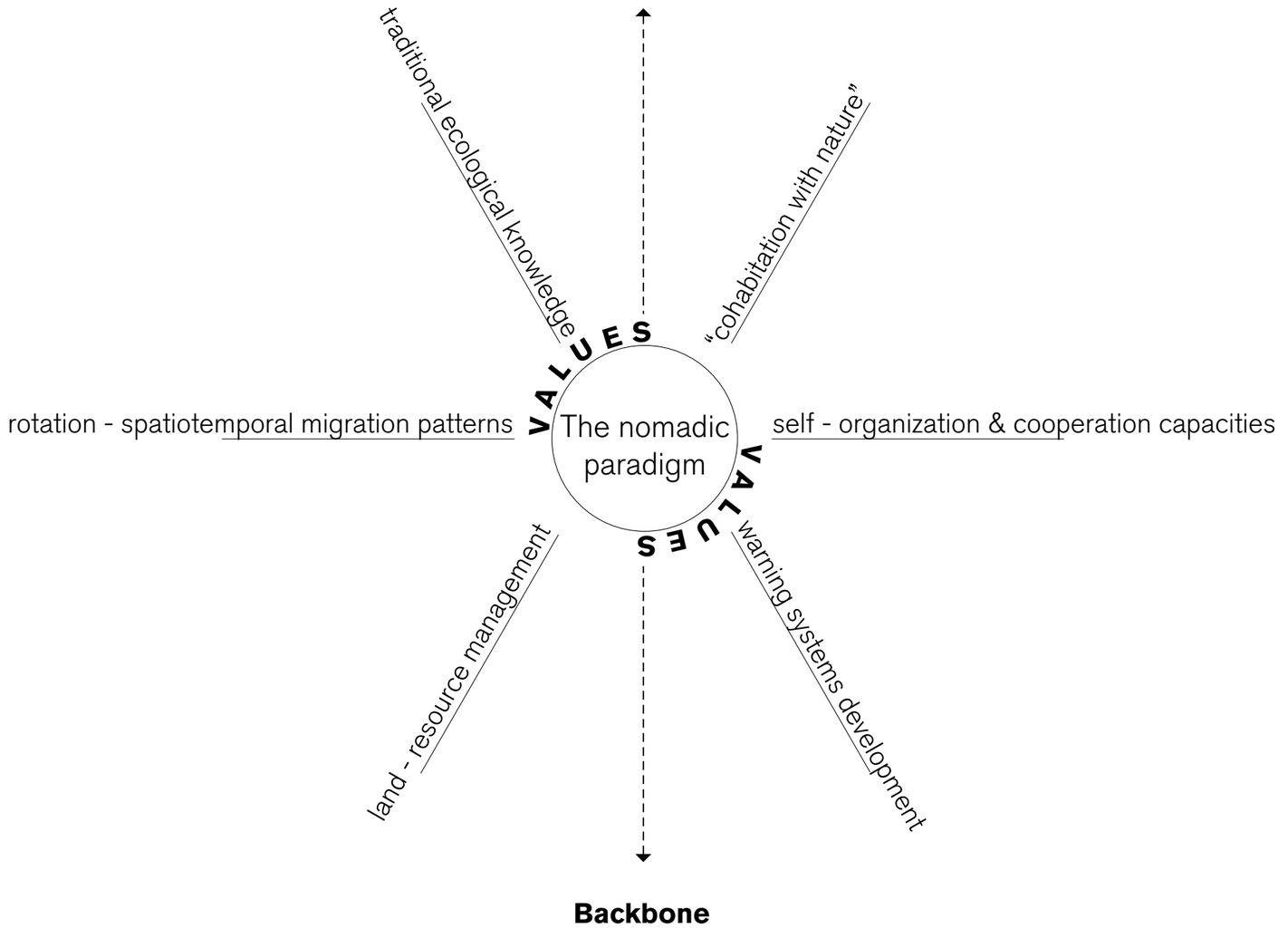
Risk + Vulnerabilities



Ex ante Sámi

The nomadic paradigm

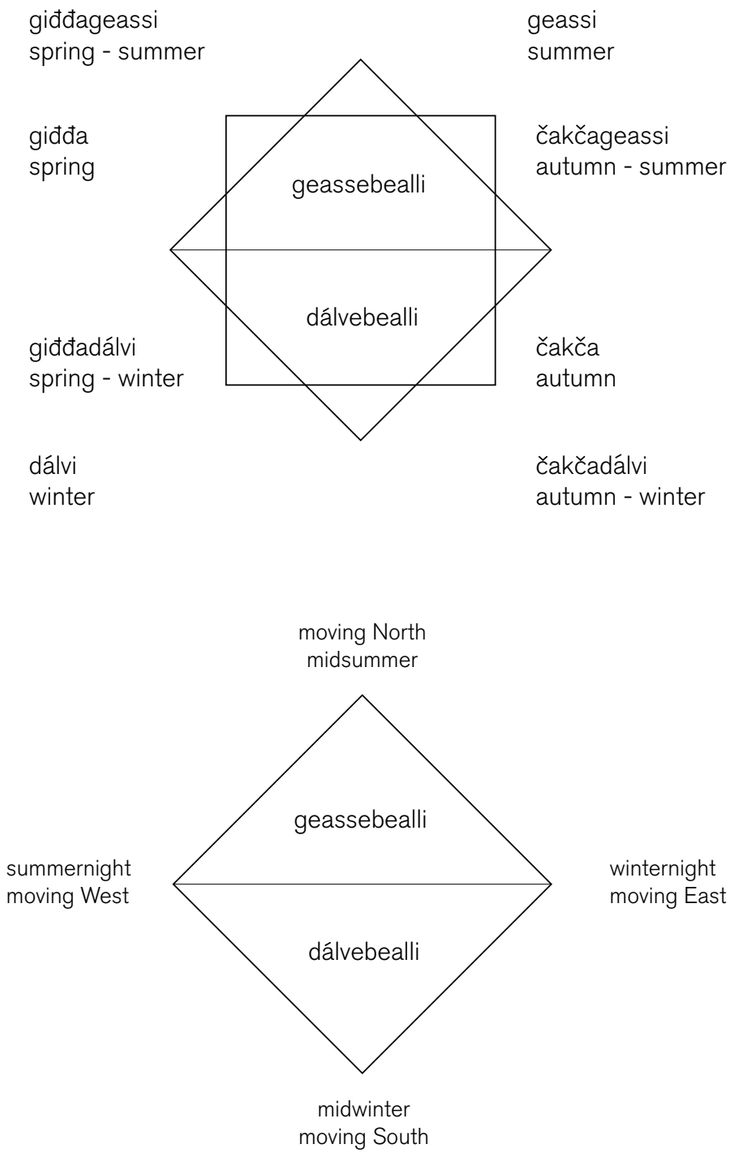
“Living in harmony with the ephemeral”



Backbone

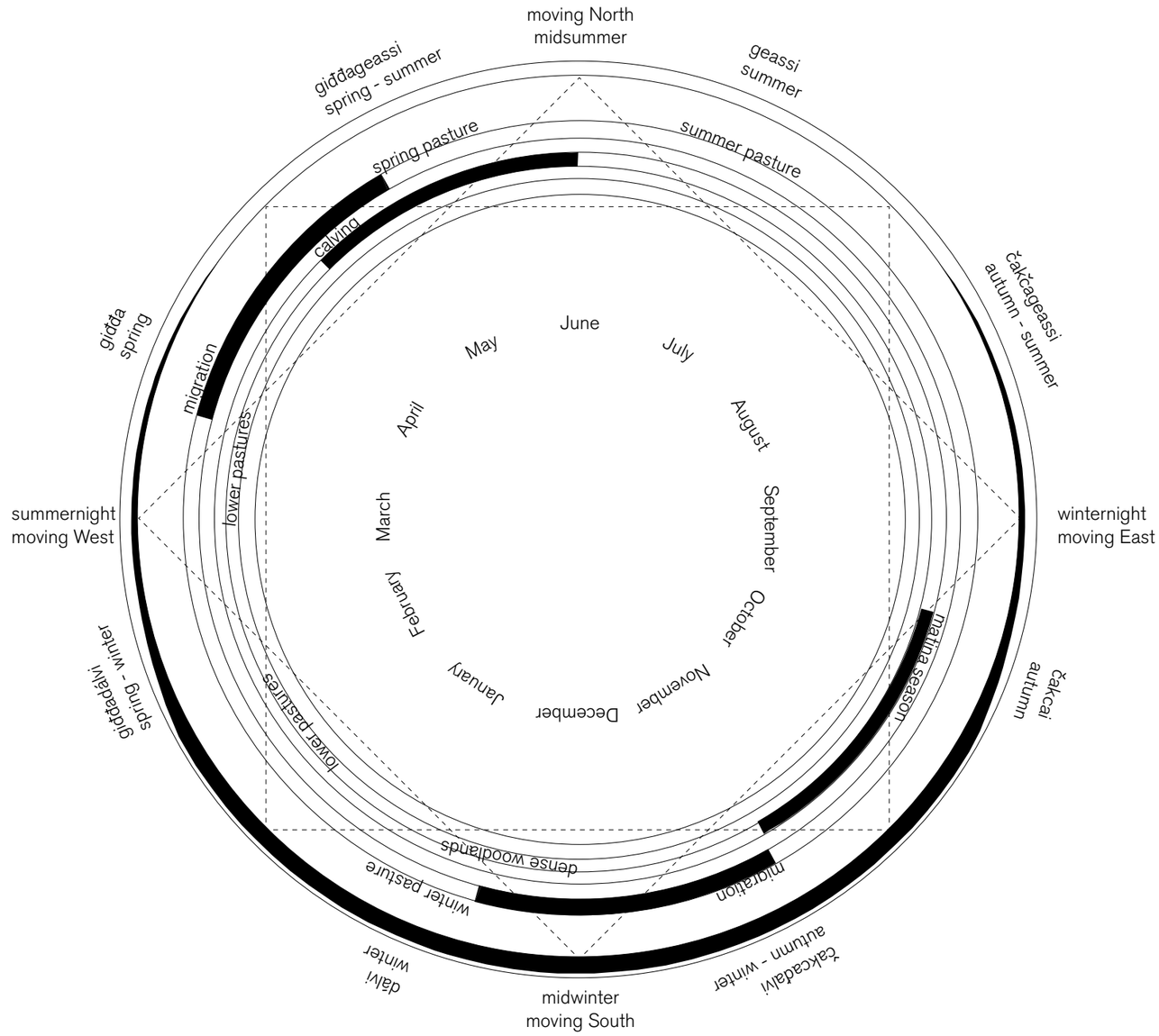
Ex ante Sámi

The nomadic paradigm



a. The traditional Sámi sun symbol, b. Summer - winter division according to the sun direction, c. annual division according to the amount of daylight

source: Mikkel Nils Sara's lecture in Samisk Høgskole, 9520 Kautokeino.



Seasonal migration patterns

Based on B. Peter's thesis, Transitional Territories 2018 - 2019, TU Delft

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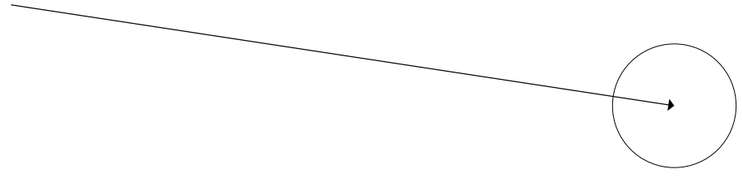
Methodology

Methodology

Hypothesis - hypothesis transition

[North Sea context]

Who?	Nomads Sámi	Sedentary Civilization
Where?	Sápmi	**?** define case study
Pressures	**Climate Change** Rising Temperatures, Flood Risk, Upredictable Precipitation Levels, Drought **Globalization & Neoliberal Growth** Deforestation, Hydropower Development, Mining, Oil Drilling, Wind Farms, Tourism, Technological Exploitation, Lack of Representation, Social Injustices **Current Tendencies** Nordic Vision	**?** define pressures
Current State	**Nomadic Paradigm** “Living in harmony with the ephemeral”	**Permanence - Stability, “More is More”**
New State		



Methodology
Multiscalarity

Methodology

Research question

How can a **shift** towards the **nomadic paradigm** inform **spatial planning** and **landscape design** concerning **risk mitigation** and **climate adaptation**, in order to **re – conceptualize the resilience framework** within the **Wadden Sea Region**?

Methodology

Multiscalarity & research sub - questions

from territorial to regional scale

What are the current and future pressures for the Wadden Sea Region in relation to climate change and over – extraction and what kind of synergy between ecology and economy would allow risk mitigation?

from regional to island scale

Which adaptive spatial strategies should be implemented on Texel Island, in order to enhance co – habitation of nature and human systems?

island scale

Which specific interventions would increase the adaptive capacity on Texel Island, activate awareness and increase involvement of the local actors?

Methodology
Roadmap

Multiscalar Analysis

Design and Strategies

Evaluation

Nomadism

1st interpretation
the “encapsulated nomad”

2nd interpretation
the “nomad in co - habitation”

Nomadic Territories

Sámi [ex ante]

Pressures
[Globalisation - Climate change]

exogenous — endogenous

Risk
+
Vulnerabilities

Values

“The nomadic paradigm”

“The need for a shift”

Paradigm Shift

for sedentary civilization

Wadden Sea

Transitional Territories Studio Relevence

North Sea

the “agents of change”
[natural, anthropogenic]

Wadden Sea

Pressures
[Globalisation - Climate change]

exogenous — endogenous

Risk
+
Vulnerabilities

Values

Texel

Pressures
[Globalisation - Climate change]

exogenous — endogenous

Risk
+
Vulnerabilities

Values

Scenarios → Manifesto

Ecology - Economy
Pace of Change

“De - Growth scenario”

Vision 2100 ← Design Principles ← Evolving Vision

The “living lab” → Design Application → Evaluation

- Place Specific Vulnerability Assessment
- Design Intervention
- Stakeholders Analysis
- Nano Scale

Evaluation

Limitations

Conclusion

Reflection

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North Sea --> Wadden Sea --> Texel

North Sea --> Wadden Sea --> Texel

Agents of change

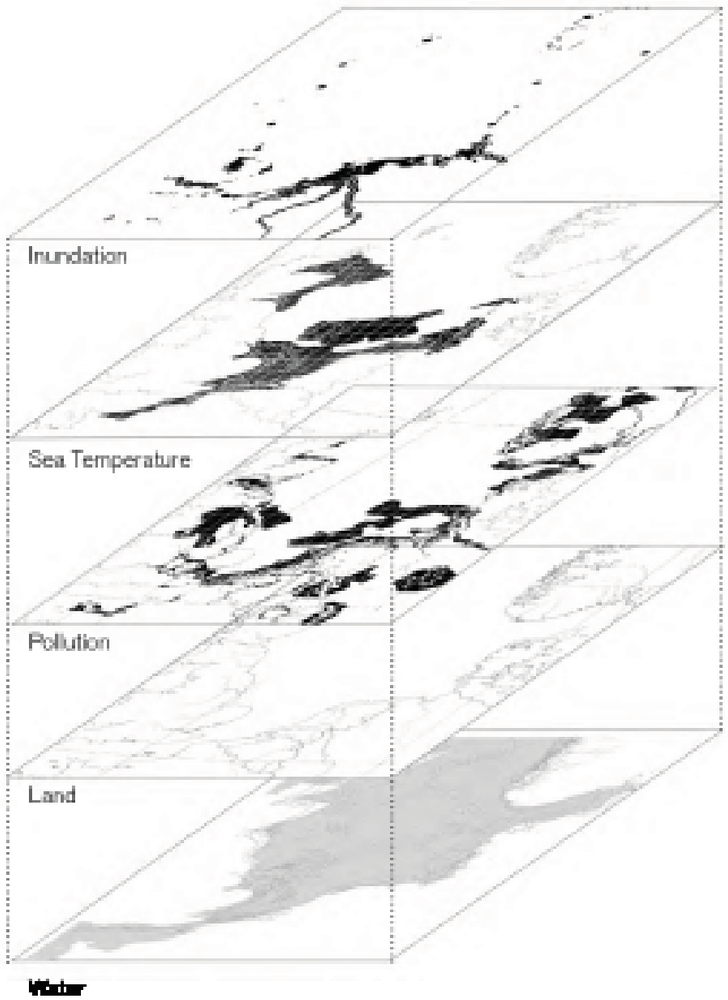
continuous change in time and space

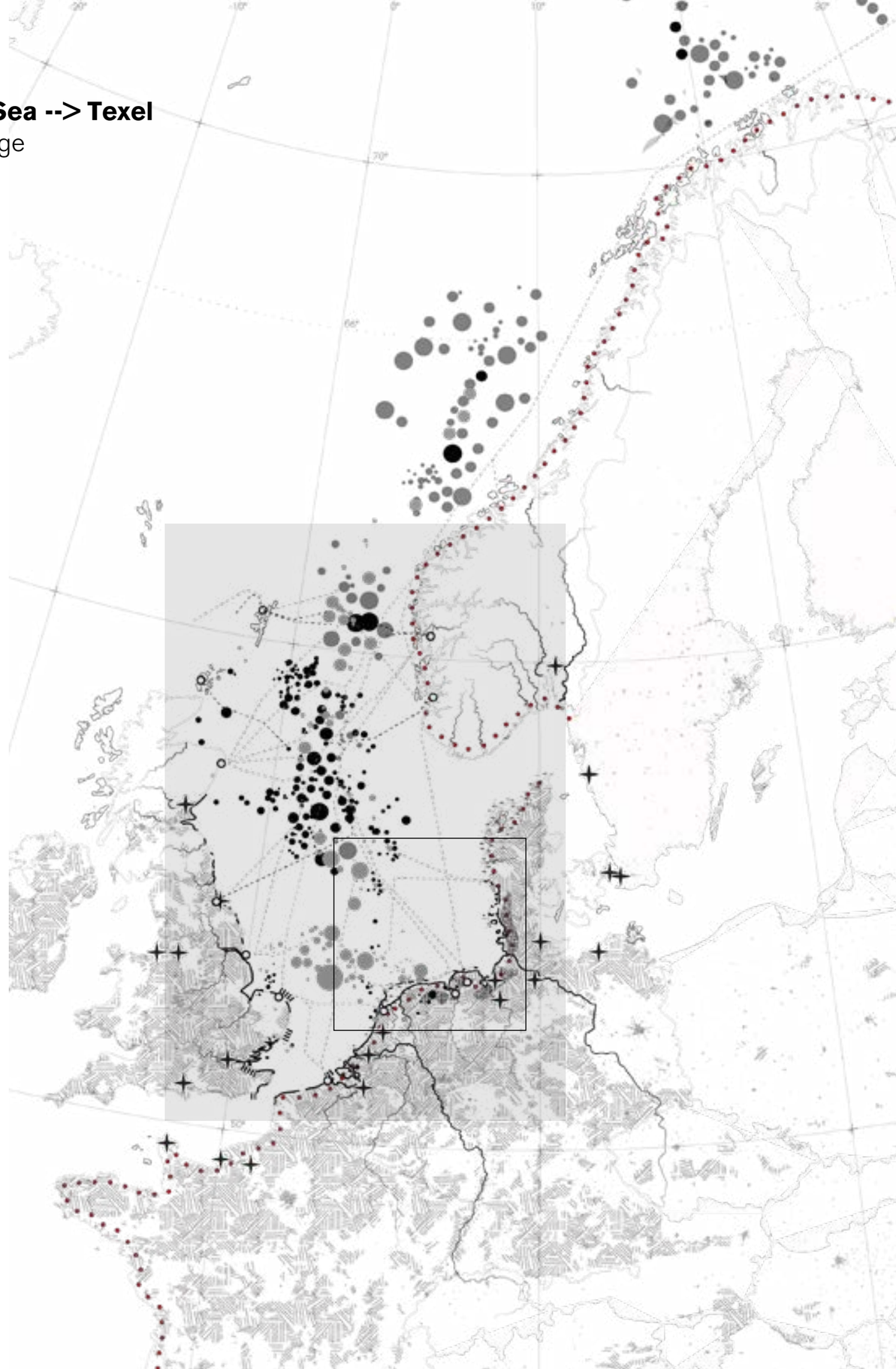
natural agents

- climate
- natural forces
- topography
- soil

anthropogenic agents

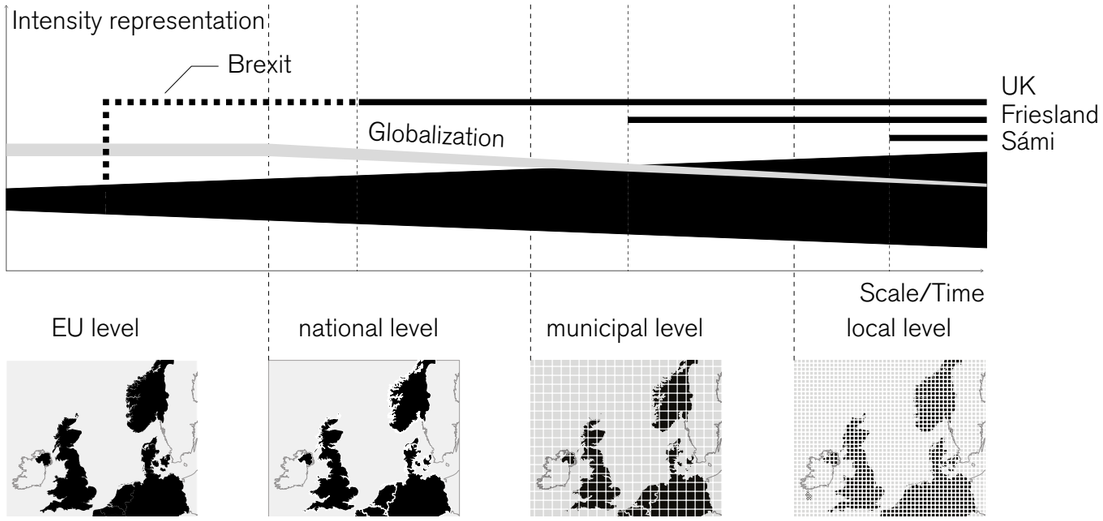
- human systems
- human (infra)structures
- socio cultural systems

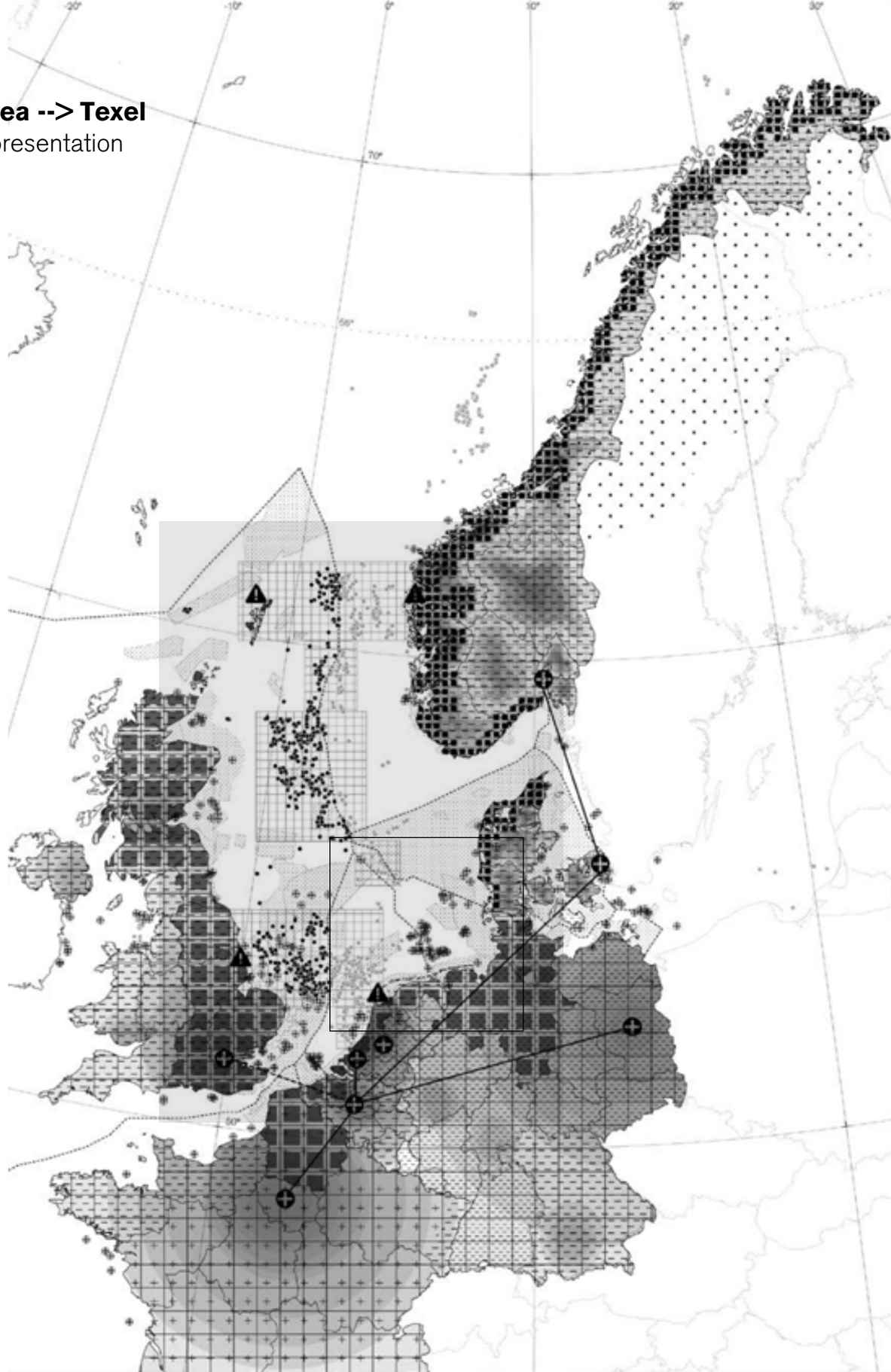




North Sea --> Wadden Sea --> Texel

Governance - Crisis of representation



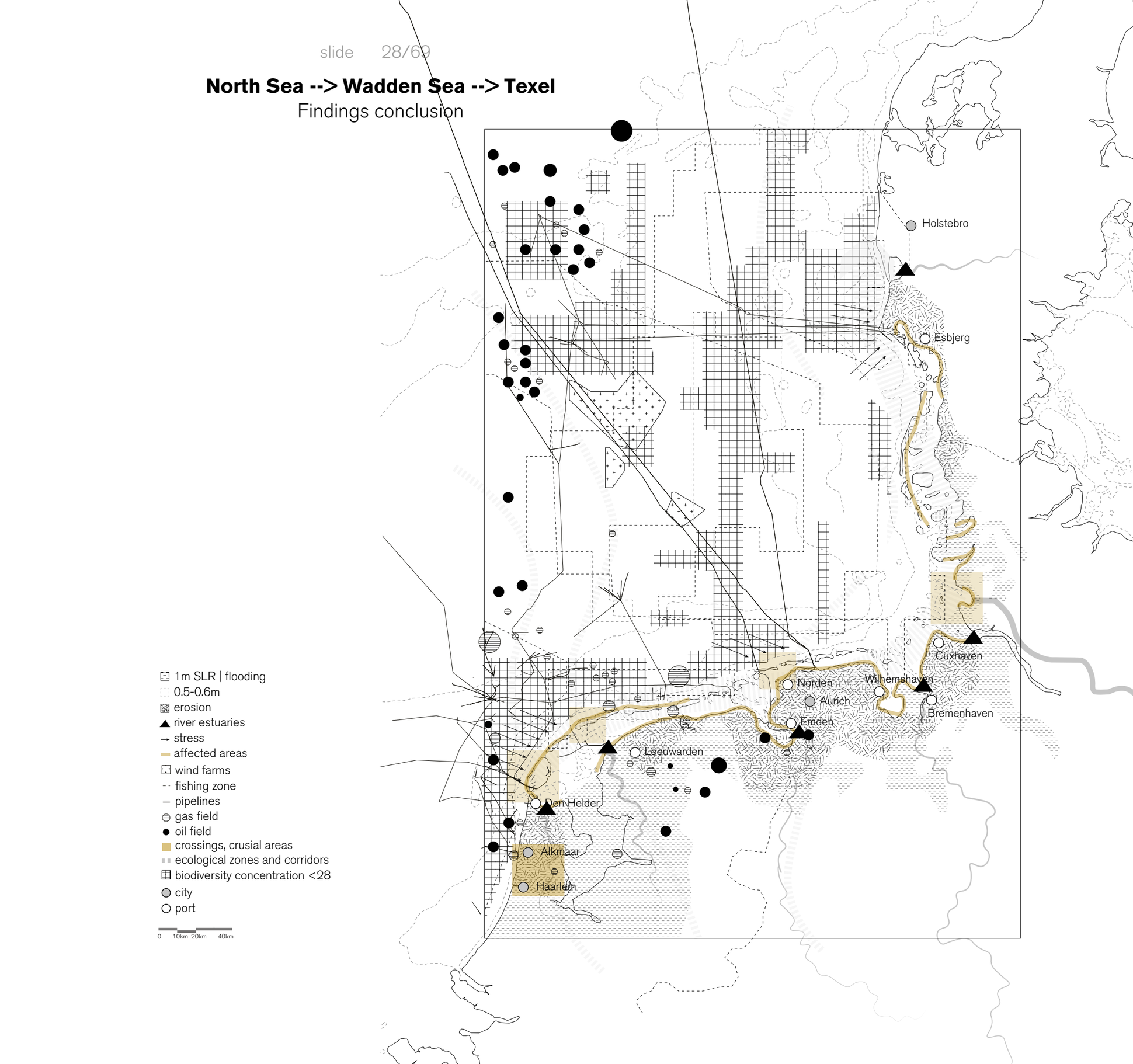


North Sea --> Wadden Sea --> Texel

Findings conclusion

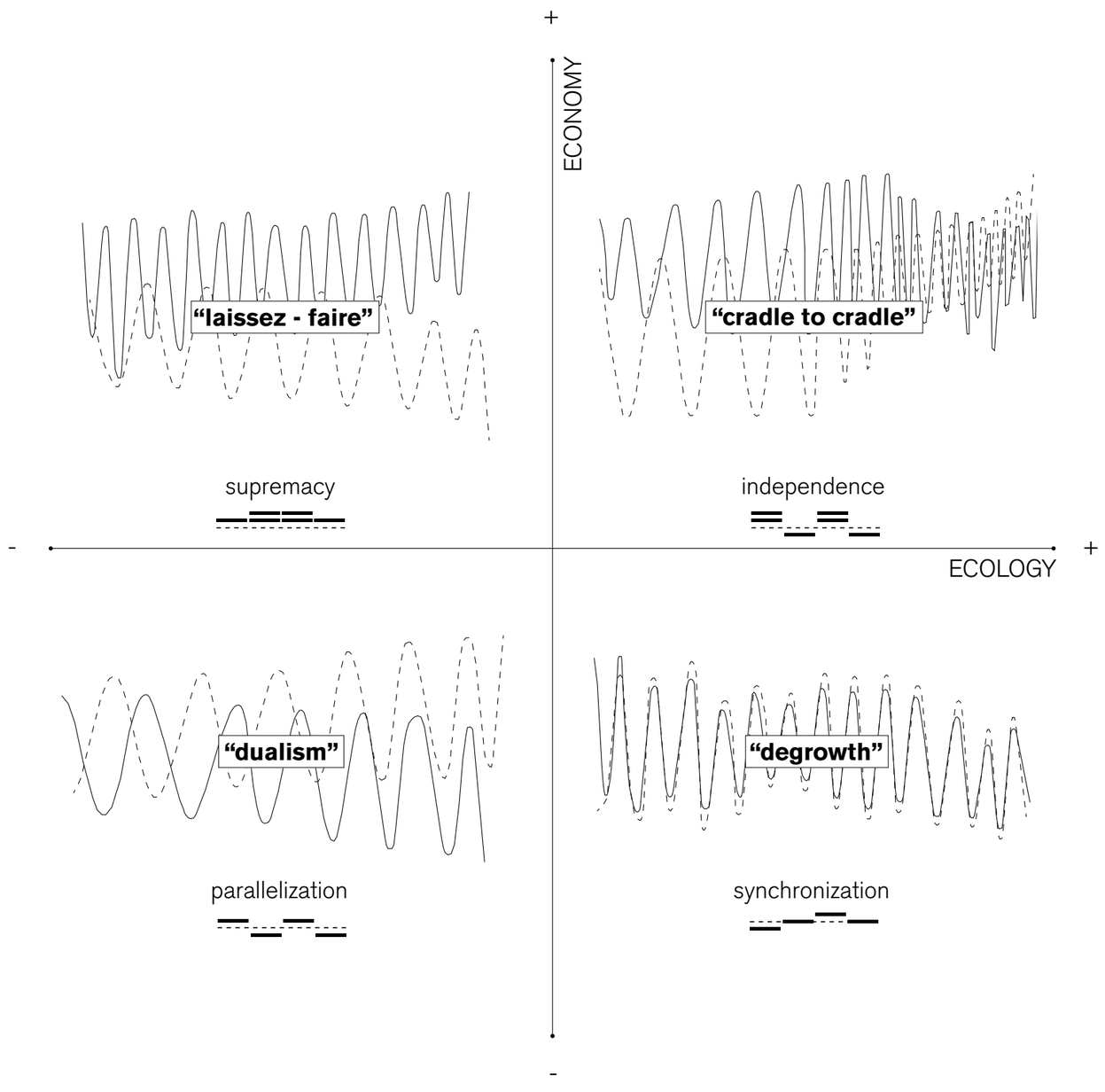
Challenges in terms of:

- safety
- productivity
- permeability



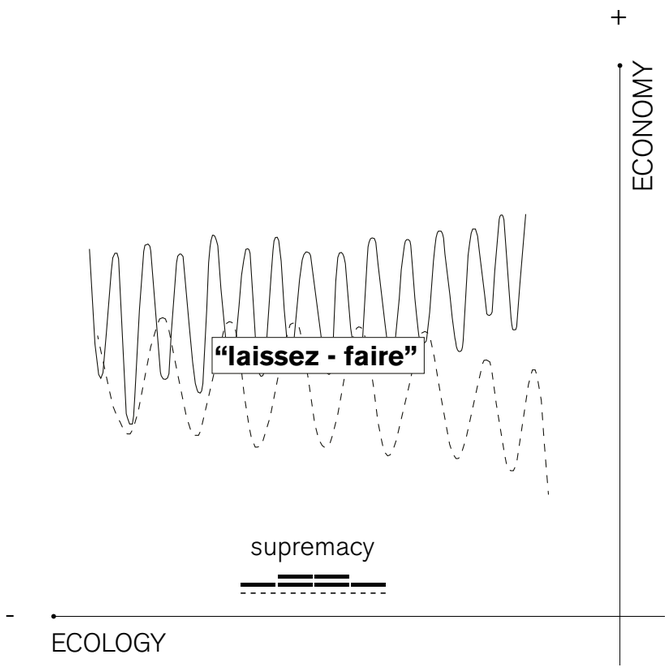
North Sea --> Wadden Sea --> Texel

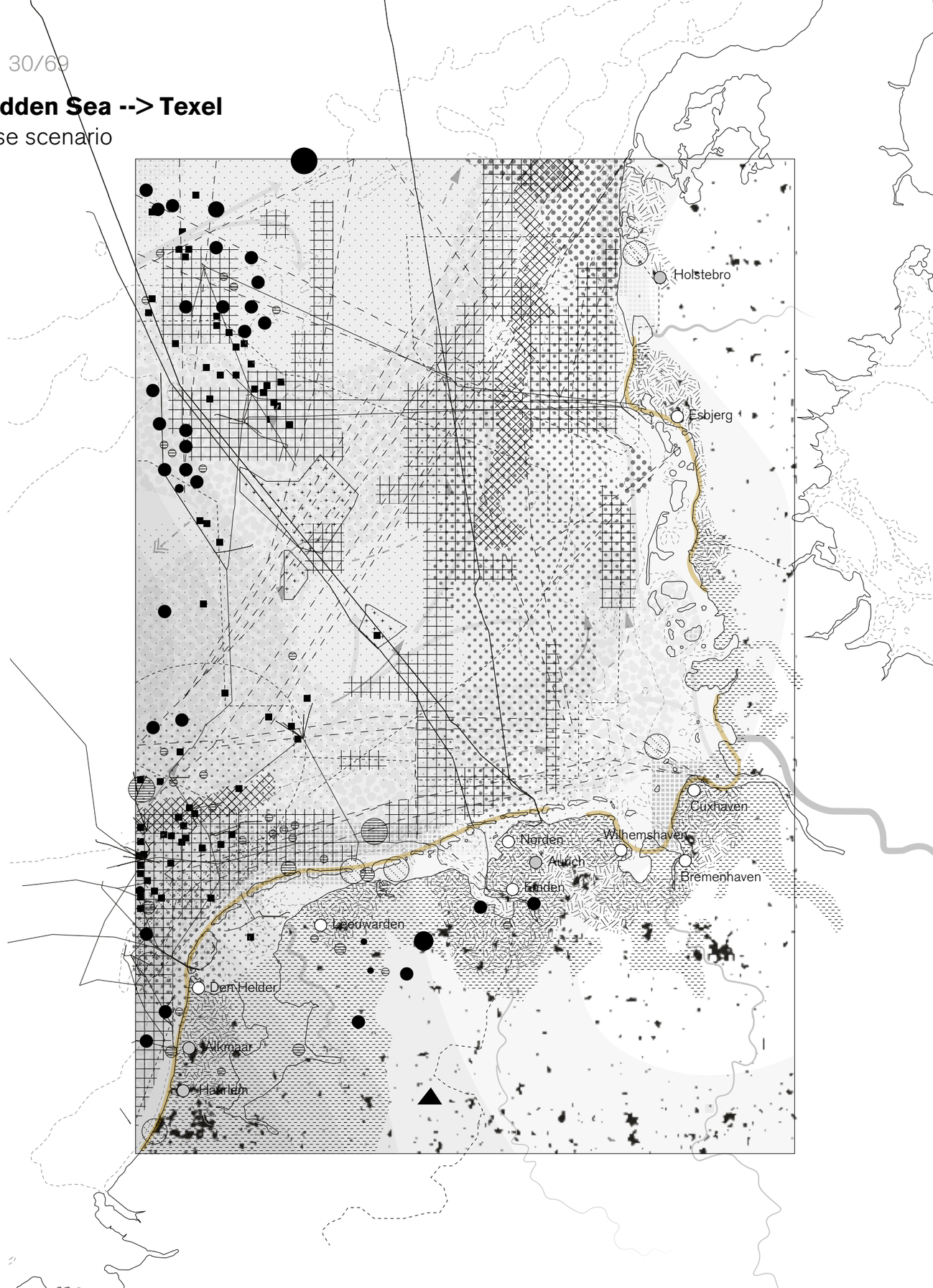
Future scenarios - pace of change



North Sea --> Wadden Sea --> Texel

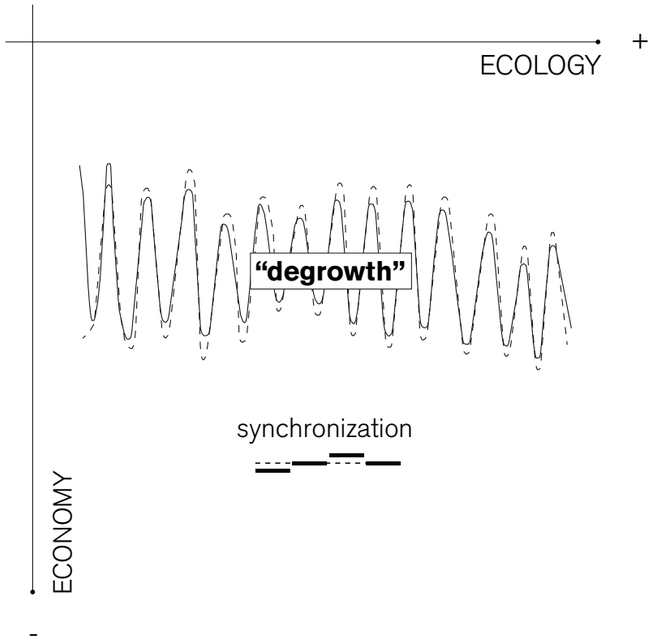
Worst case scenario

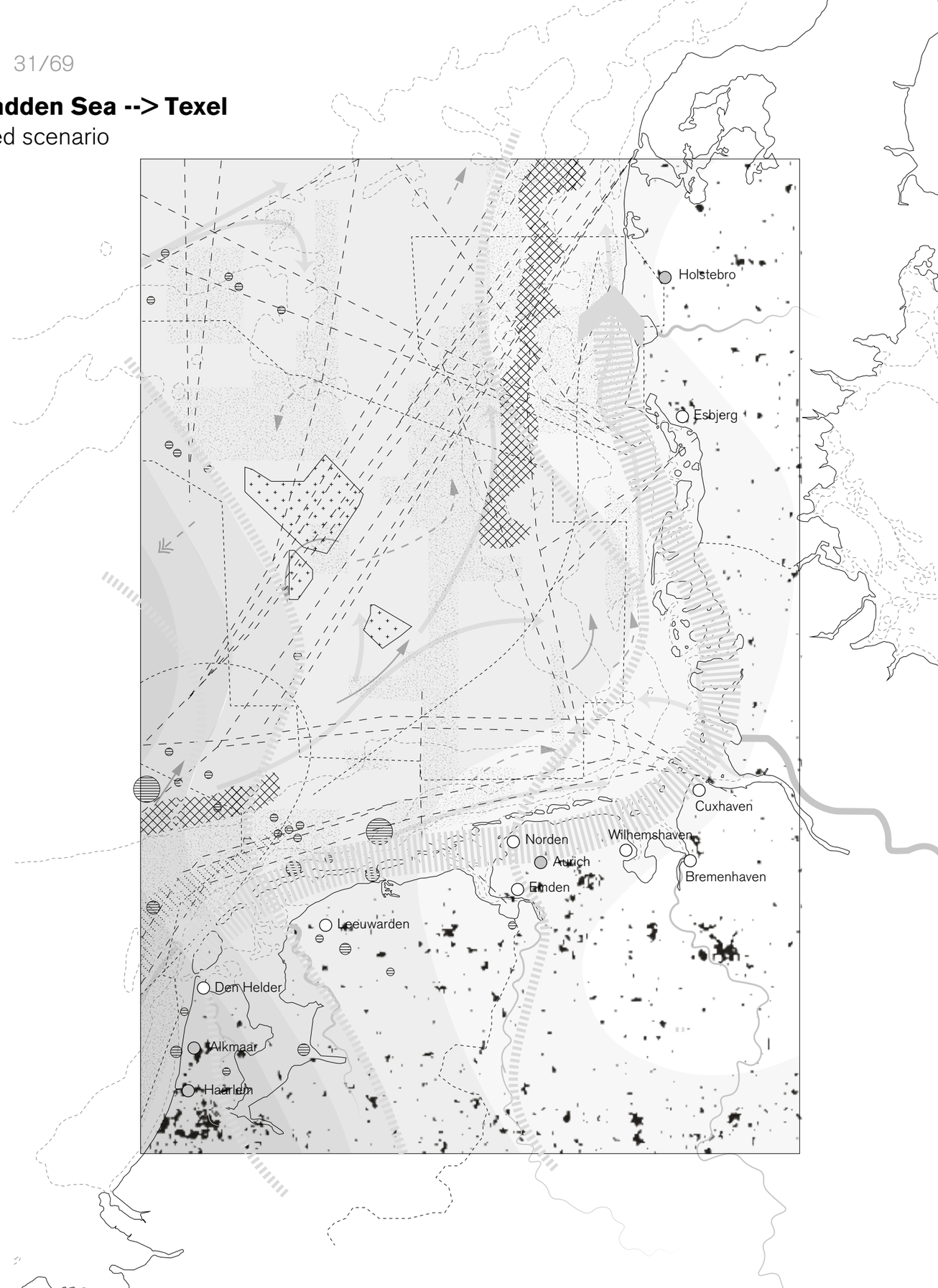




North Sea --> Wadden Sea --> Texel

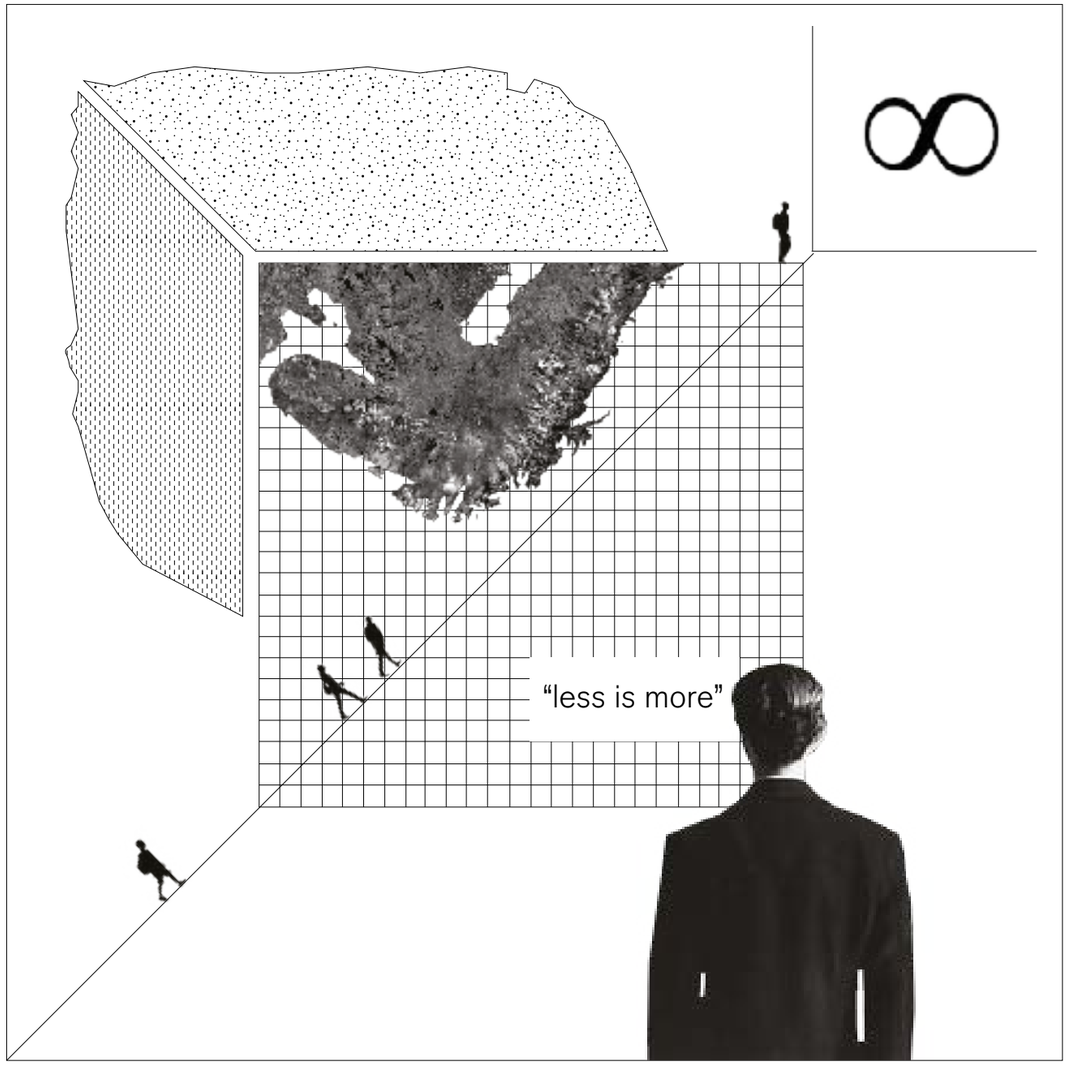
Proposed scenario





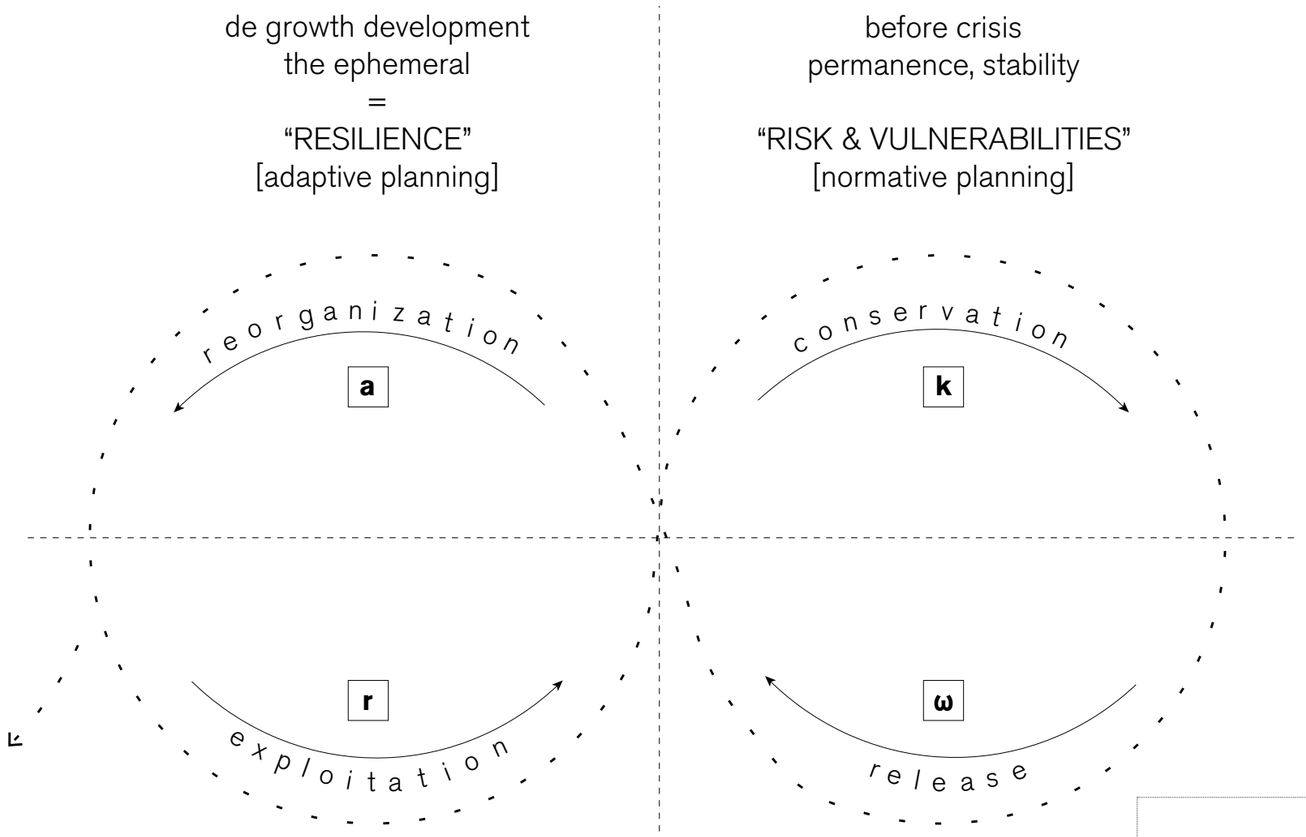
North Sea --> Wadden Sea --> Texel

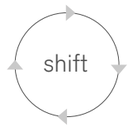
Manifesto



North Sea --> Wadden Sea --> Texel

Manifesto



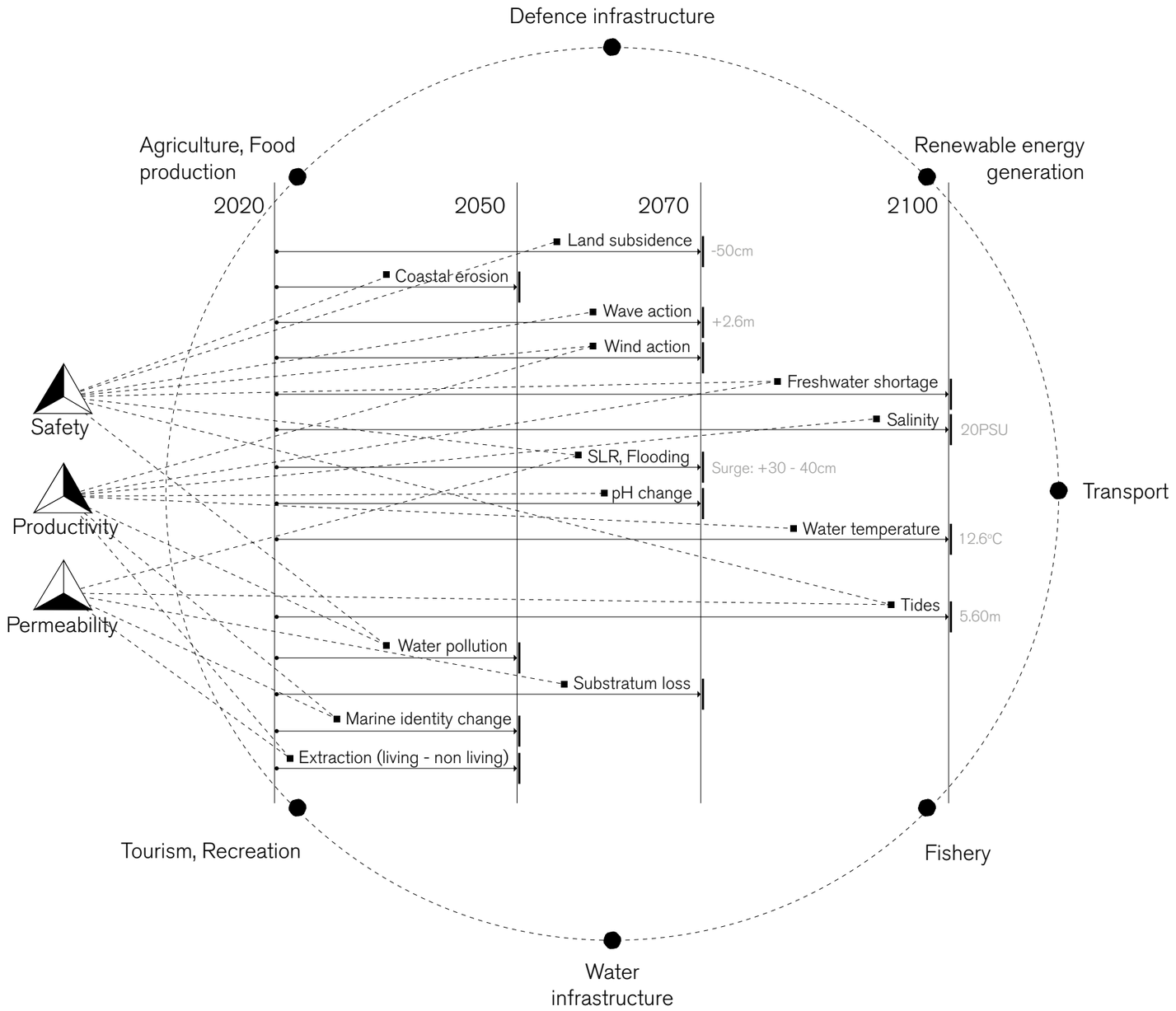


socio - cultural values

Theoretical framework:
Evolutionary resilience (Davoudi, 2013)
The panarchy model (Gunderson & Holling, 2002)
Degrowth (Fournier, 2008)
Disaster cycle (Sobiech, 2013)

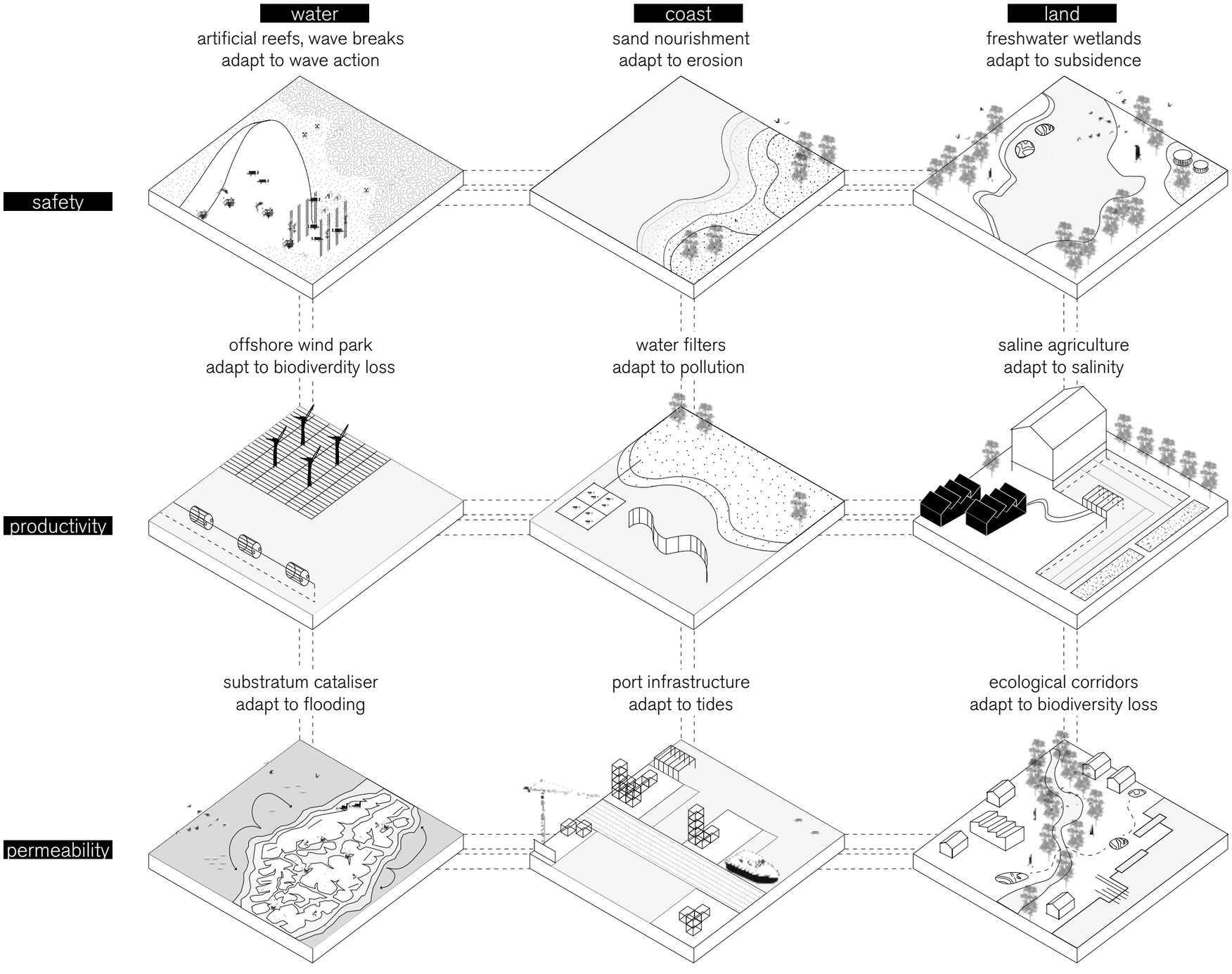
North Sea --> Wadden Sea --> Texel

Deadlines to adapt



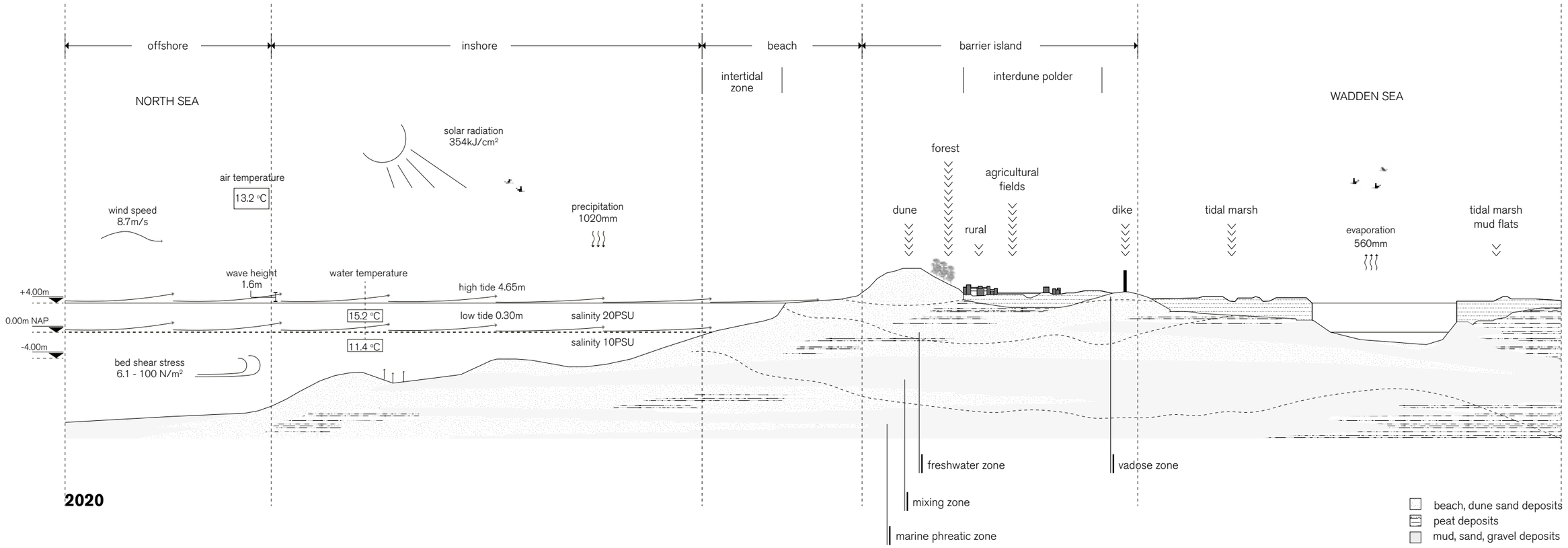
North Sea --> Wadden Sea --> Texel

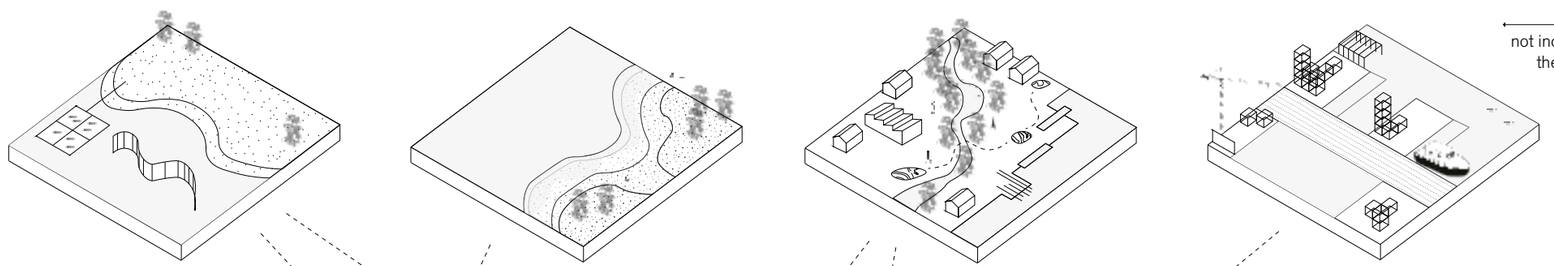
Design principles



North Sea --> Wadden Sea --> Texel

Evolving adaptation





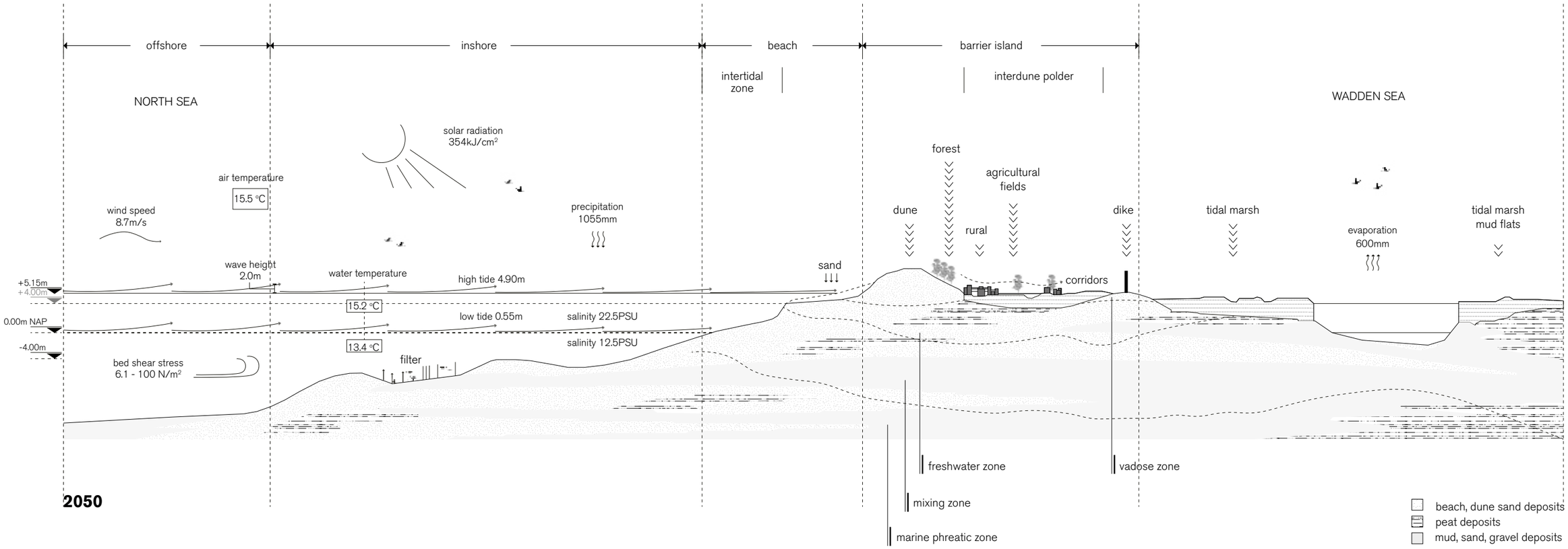
Present
2020

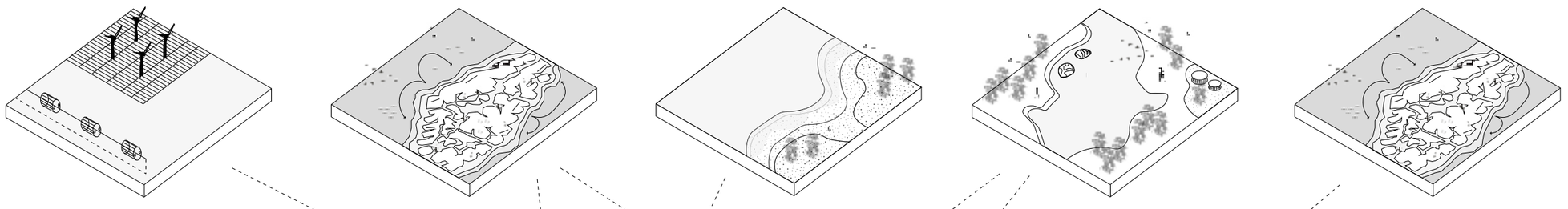
2050

Safety — Productivity — Permeability

North Sea --> Wadden Sea --> Texel

Strategic framework - evolving adaptation



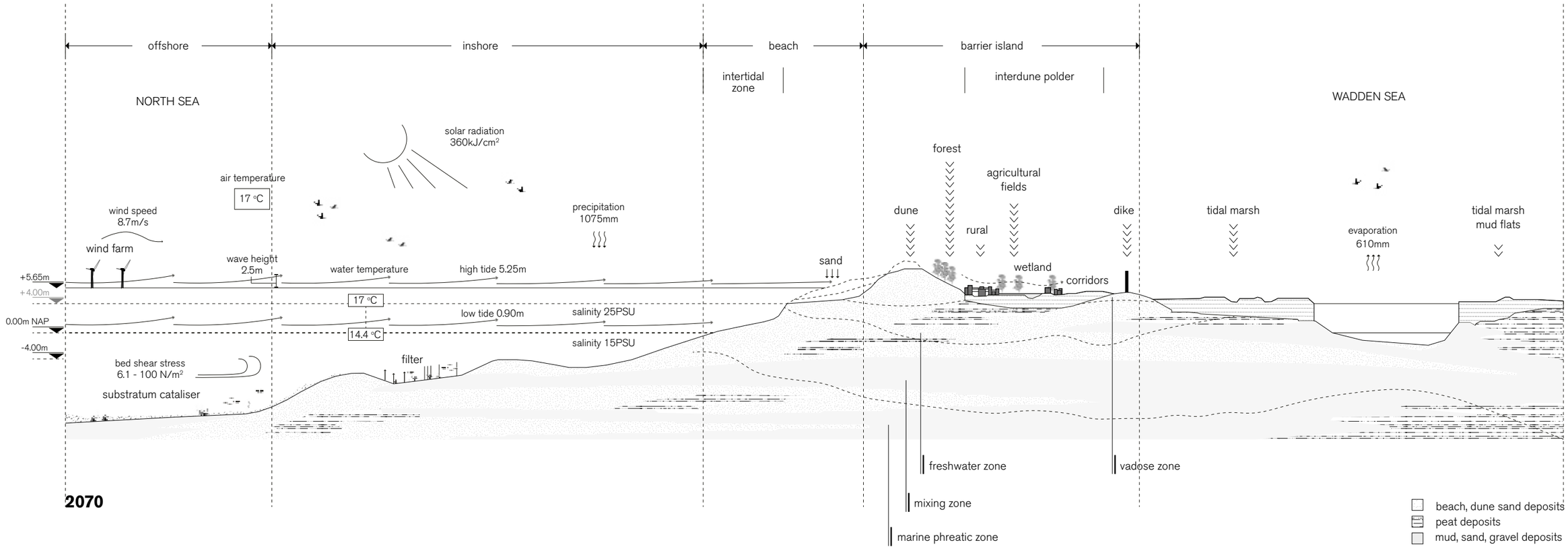


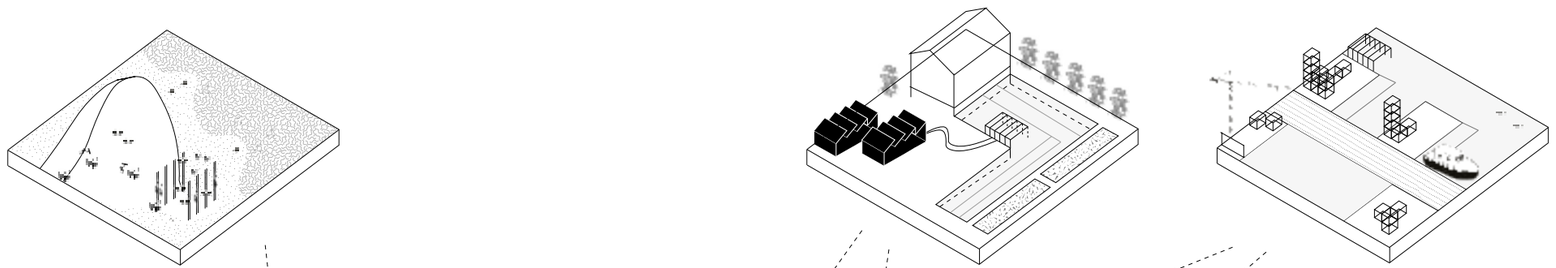
2050 — 2070

Safety — Productivity — Permeability

North Sea --> Wadden Sea --> Texel

Strategic framework - evolving adaptation



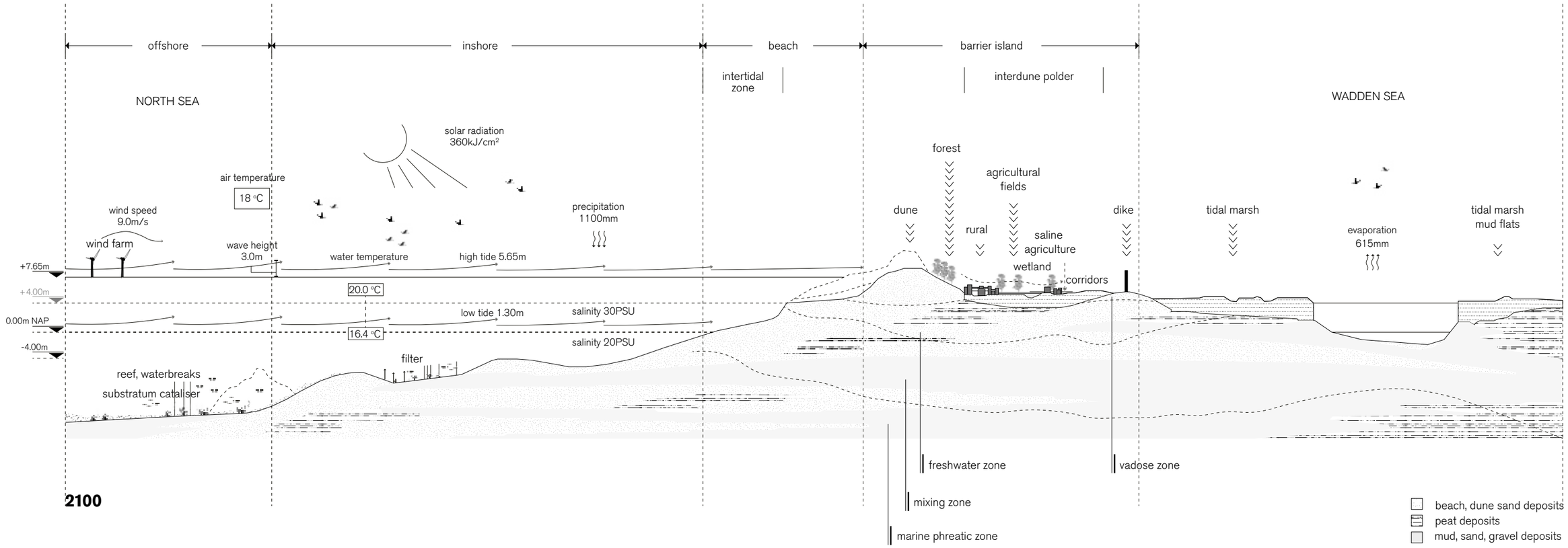


2070 — 2100

Safety — Productivity — Permeability

North Sea --> Wadden Sea --> Texel

Strategic framework - evolving adaptation

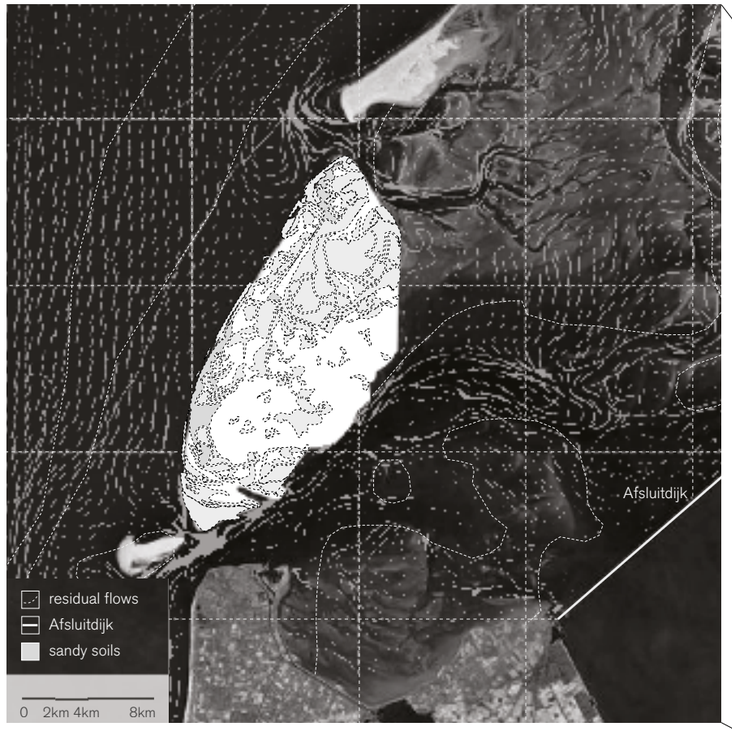


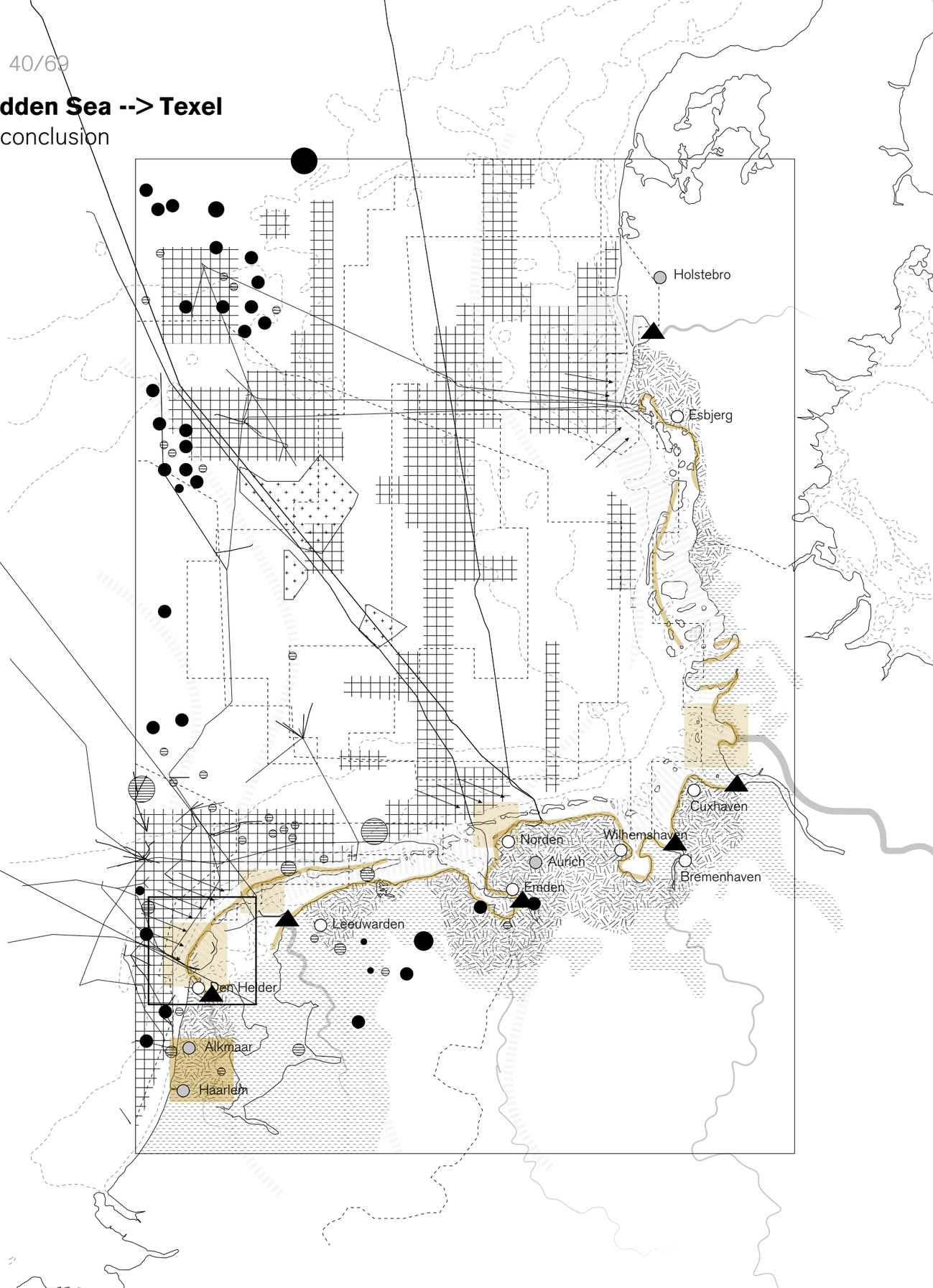
2100

Safety — Productivity — Permeability

North Sea --> Wadden Sea --> Texel

Findings conclusion





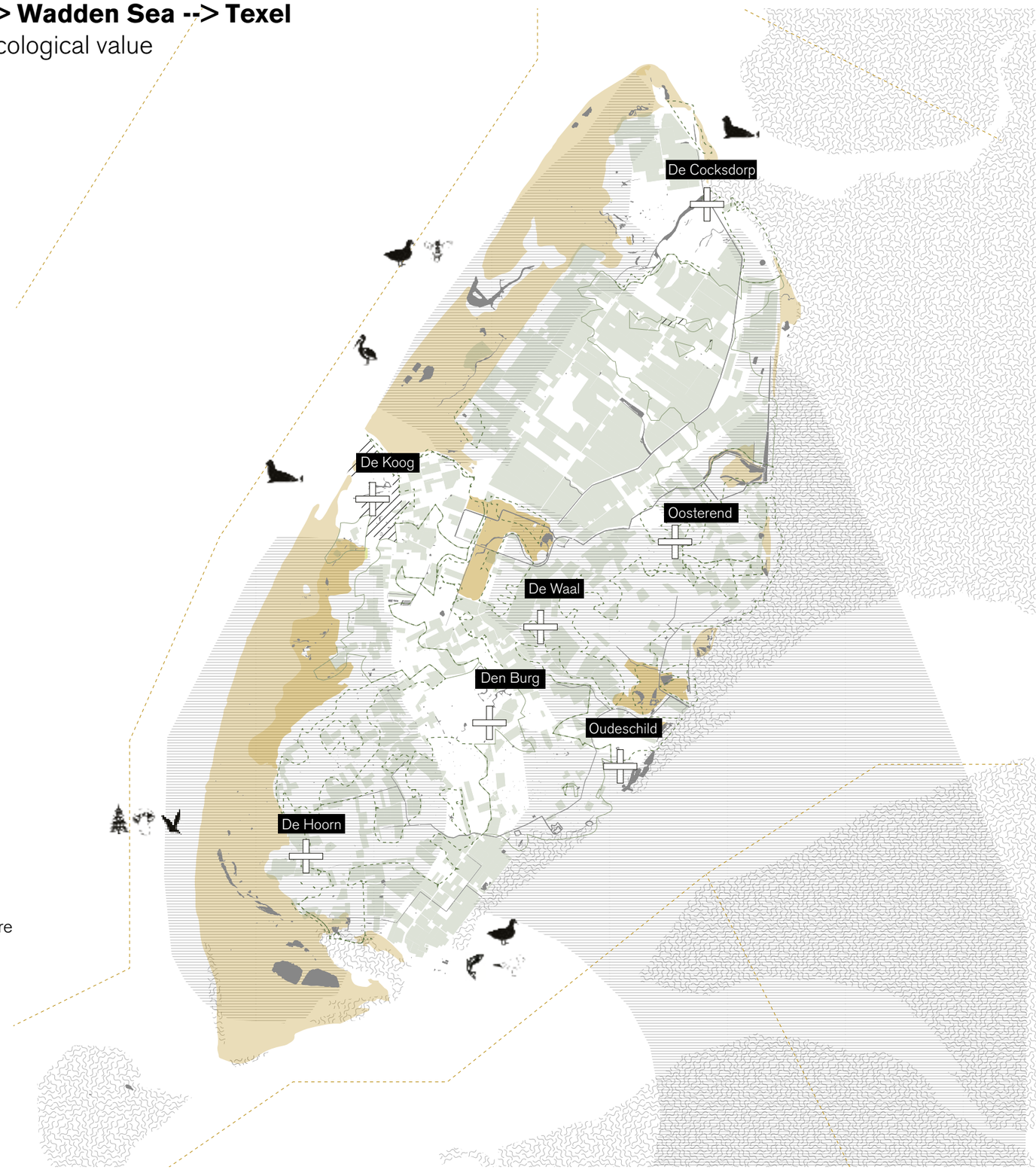
North Sea --> Wadden Sea --> Texel

Ecological value

Nature 2000
key role for worldwide biodiversity

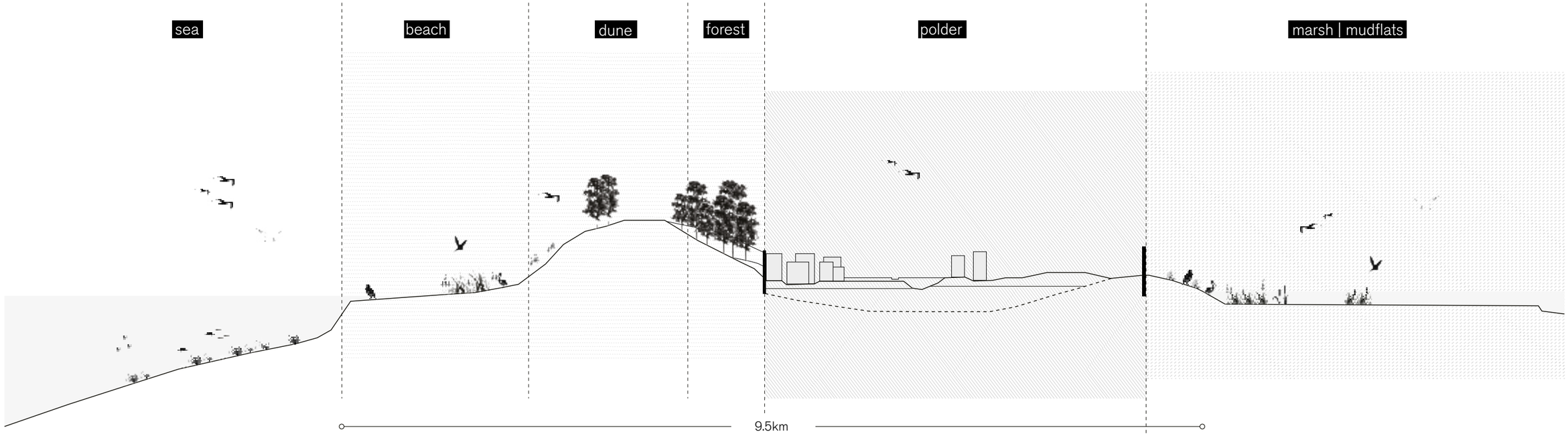
- positioned in the crossroads of water bird flyways
(feeding, breeding, nesting, resting)
gulls, terns, geese, ducks etc

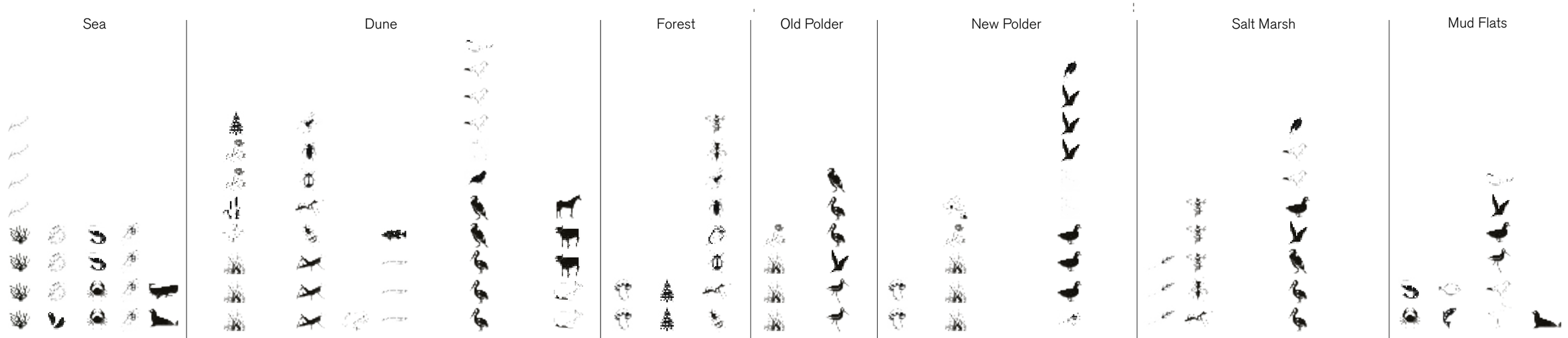
- large number of aquatic species
(nursery, spawning, feeding)
fish, crustacean species, seals etc



North Sea --> Wadden Sea --> Texel

Habitat diversity - ecosystems succession





North Sea --> Wadden Sea --> Texel

Permanent & temporary capacity

> 1 million visitors / year
local economy: 70% based on tourism

- insufficient awareness of tourists about water use
- only one drinking line with mainland
- Texel has to make its own watershed

permanent capacity

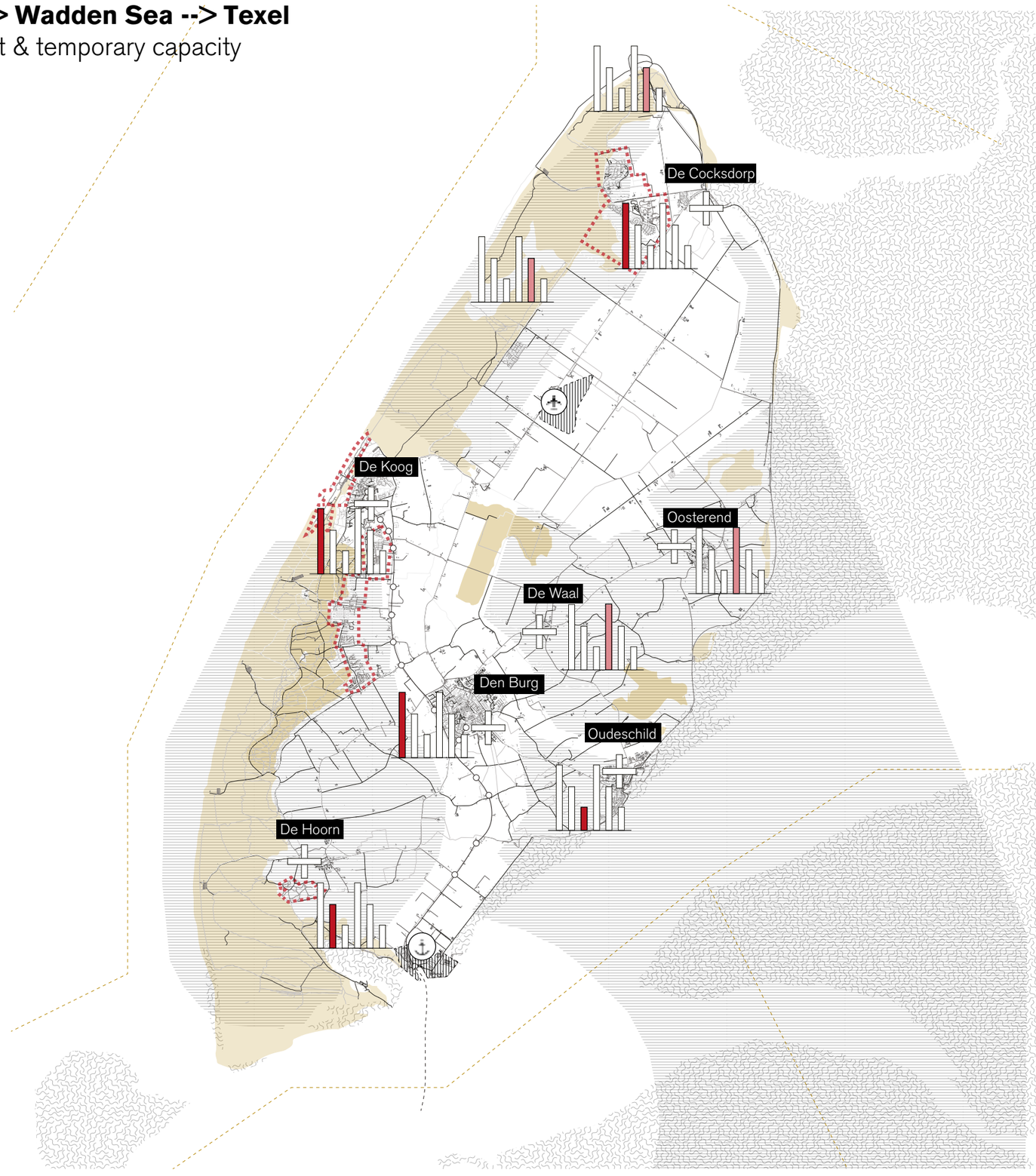
Texel	13,547 inhabitants
De Cocksdorp	842
De Koog	1,300
Oosterend	1,200
De Waal	415
Den Burg	7,000
Oudeschild	2,170
De Hoorn	620

temporary capacity (map)

high
low
long short

- built - up space expansion
- locations
- mobility network
- port - airport
- natura 2000 HR
- natura 2000 HR + VR
- intertidal mudflats
- silent area

0 1km 2km 4km



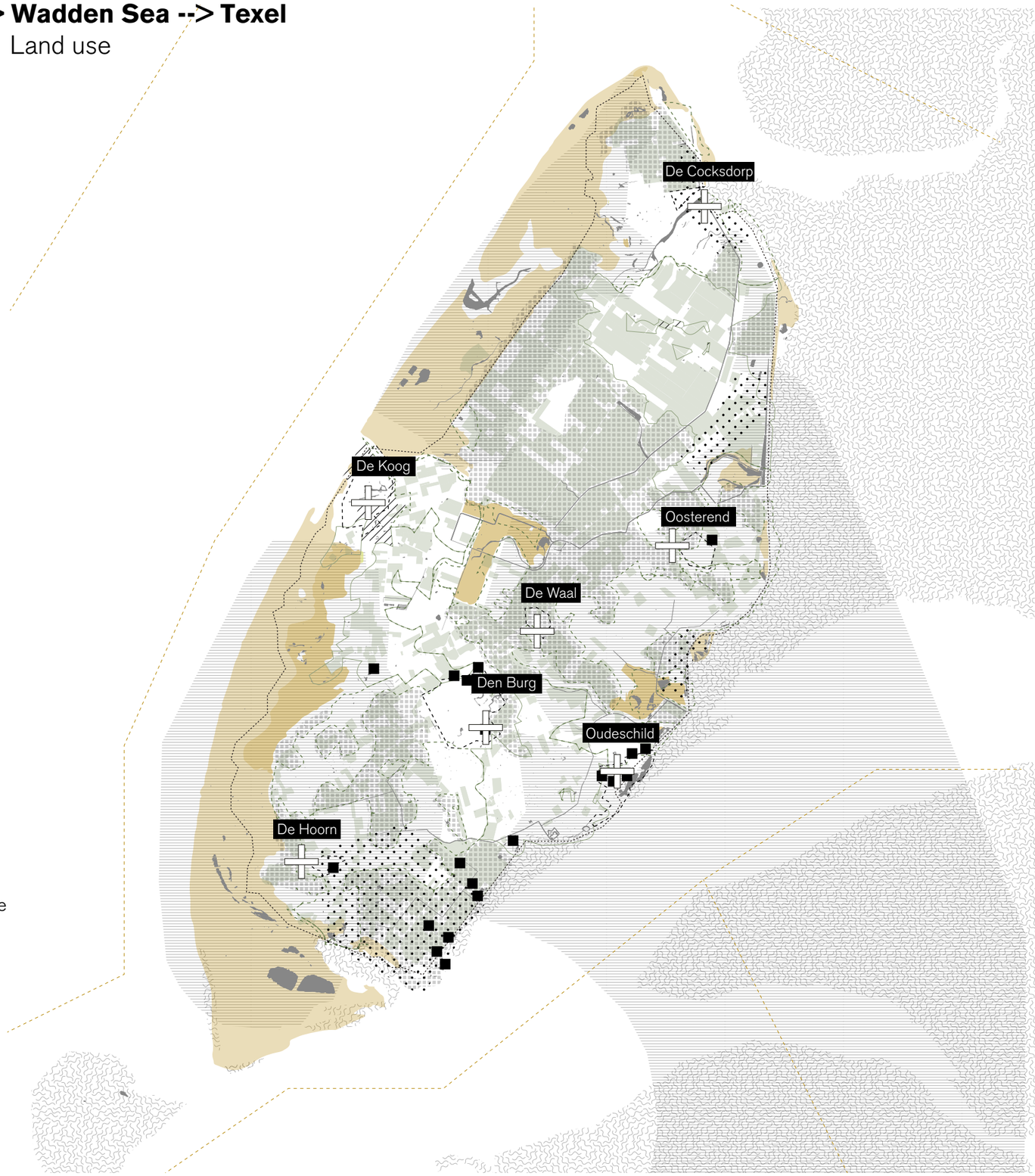
North Sea --> Wadden Sea --> Texel

Land use

- about 85% of Texel land is used for agriculture
- soil salinity decreases agricultural yields
- 2.5 times more sheep tham people --> meat, wool
- sales of wool decline

Saline Agriculture in Texel				
		Values		
Crop	Variety	Treshold	Slope (% per dS/m)	50% yield
	Miss Mignonne	4.1 (2.9 - 5.2)	6.6	11.6
	Achilles	2.9 (1.5 - 4.4)	5.6	11.9
	Foc	2.1 (0.3 - 3.8)	5.2	11.7
	Met	1.9 (0.2 - 3.7)	5.0	12.0
	927	3.4 (1.8 - 5.1)	5.2	13.1
	FAO ref	1.7	12	5.9
	Cas	4.5 (1.8 - 7.3)	5.6	13.4
	Ner	3.6 (0.5 - 6.6)	6.1	11.8
	Nat	-	-	-
	Ben	-	-	-
	101	3.0 (0.3 - 5.8)	9.0	8.6
	102	5.0 (1.9 - 8.1)	11.2	9.4
	Pri	2.1 (0 - 6.0)	9.0	7.6
	FAO ref	1.0	14	4.6
	Alo	2.4 (0 - 7.6)	7.7	8.9
	Red	5.9 (2.7 - 9.2)	11.7	10.2
	San	3.2 (0 - 7.2)	7.4	10.0
	Hyb	3.4 (0 - 8.0)	11.6	7.7
	FAO ref	1.2	16	4.3
	Batavia, heading, red	-	-	-
	Butterhead, Suzan	2.3 (0 - 8.7)	6.8	9.6
	Butterhead, Lob	1.8 (0 - 10.7)	5.8	10.3
	FAO ref	1.3	13	5.1
	White cabbage, early	4.6 (2.9 - 6.2)	7	11.7
	FAO ref	1.8	9.7	7.0
	Broccoli	5.6 (1.2 - 10.1)	6.3	13.6
	FAO ref	2.8	9.2	8.2
	Que seed 2014	3.3 (0 - 7.3)	5.3	12.8
	Que shoot 2015	1.7 (0 - 3.6)	8.4	7.6
	FAO ref	8.0	5.0	18.0

potentiality



6

The experiment

The experiment

Living lab

RISK = hazard x exposure x vulnerability

The experiment
Living lab

RISK = hazard x exposure x vulnerability

improve abilities to monitor and forecast hazards

increase awareness of hazards and human exposure to them

achieve benefits by reducing vulnerability to natural hazards

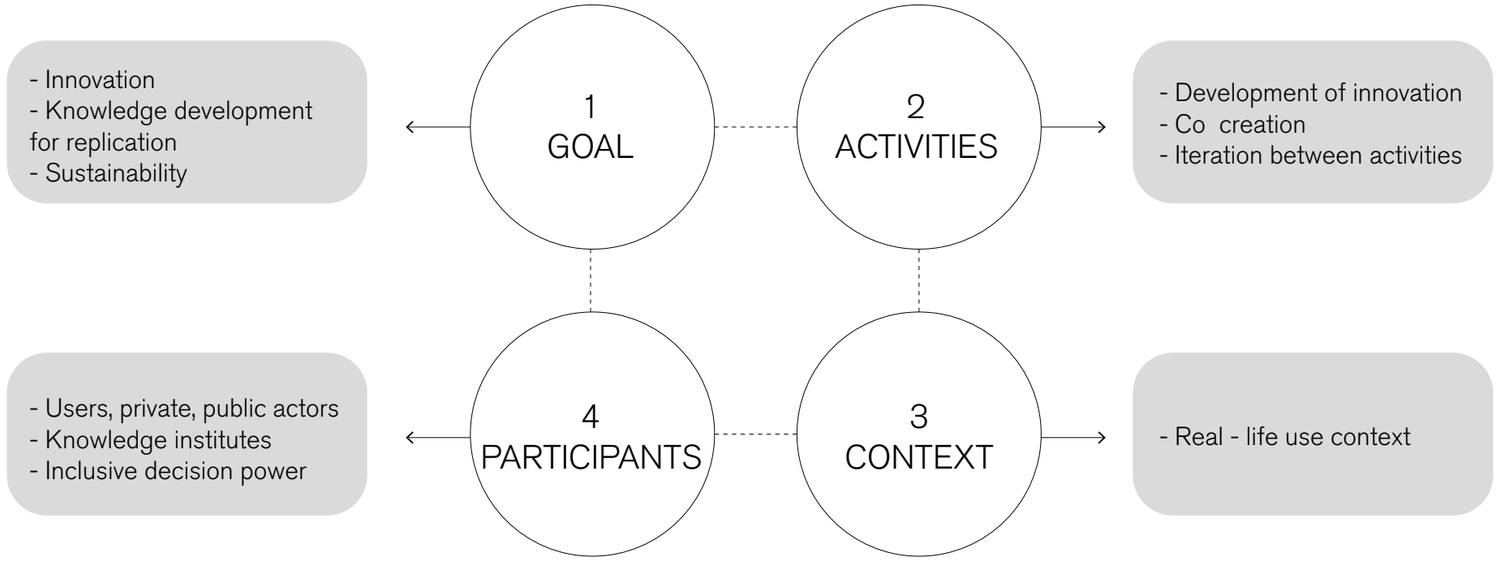
act upon | know about | self - organize

source: Sepulveda Carmona D. (2019) The defining characteristics of urban living labs
“Connecting deltas” conference proceedings, Alexandria Egypt

The experiment
Living lab

“Living lab is the research concept, which may be defined as a user-centered, iterative, open - innovation ecosystem, based on a systematic user co – creation approach in public – private – people partnerships, integrating research and innovation processes in real life communities and settings” (ENoLL, 2013).

The living lab is an in - situ experiment which performs as the activator and platform for integrated learning and adaptive, iterative, flexible, inclusionary and evolving management (Sepulveda C. D, 2019).



The defining characteristics of urban living labs

source: Sepulveda C. D. (2019) “Connecting deltas” conference proceedings, Alexandria Egypt

The experiment

From a patterned landscape to a speculative landscape

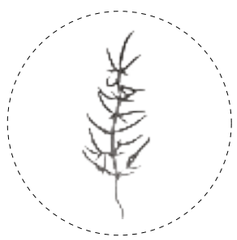
Polder landscape

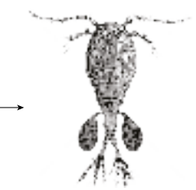
Speculative landscape

The experiment

Systemic interrelation

Salicornia europaea, Samphire

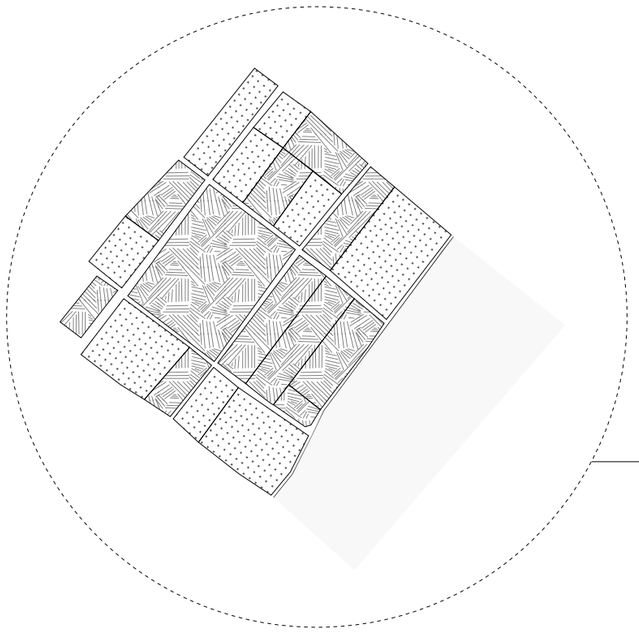




larva crustacean

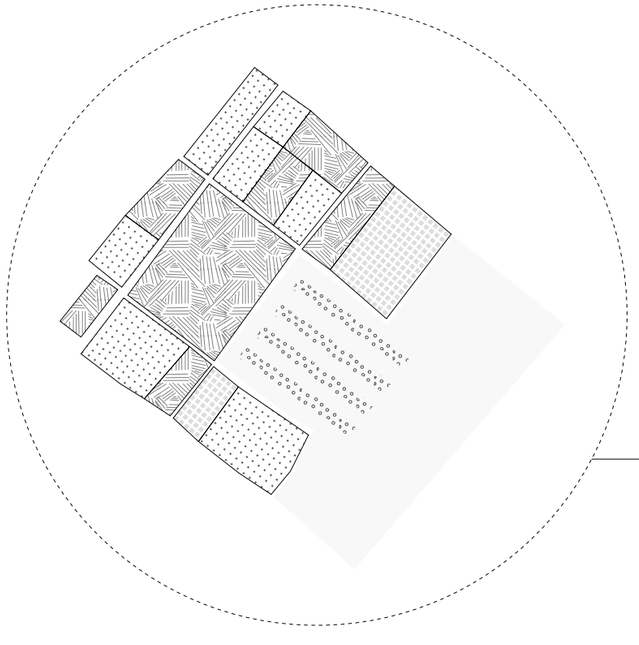
Brent Goose

fish



1

existing predominant
pasture & traditional
agriculture land

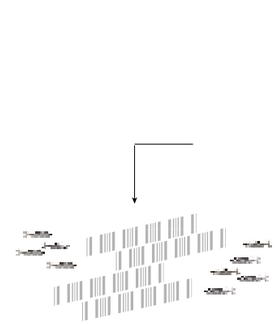


2

de - poldering
return to saltmarsh
condition

The experiment

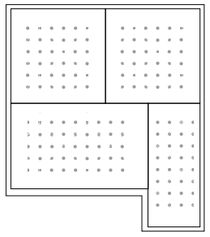
Systemic interrelation

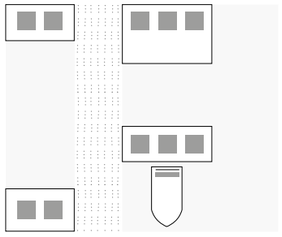


nutrient filters and shelter
for juvenile fish

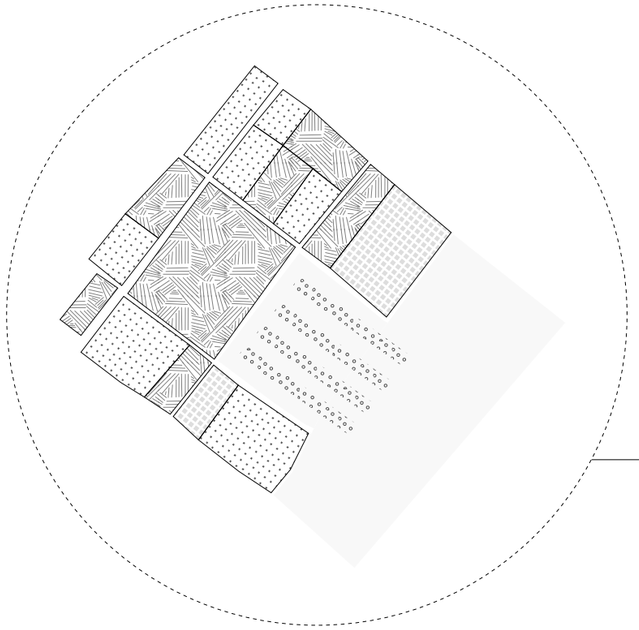
Macroalgae, Seaweed

biomass and bio - oils production



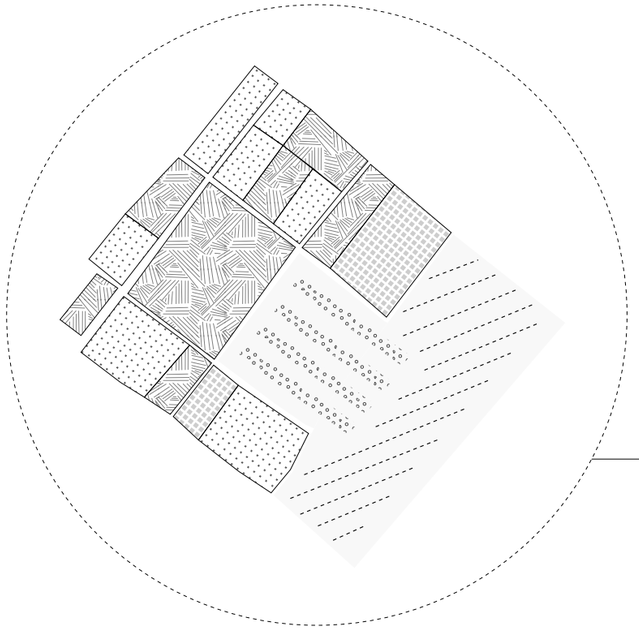


use of biomass benefits for the remaining
traditional agriculture and port activity



2

de - poldering
return to saltmarsh
condition

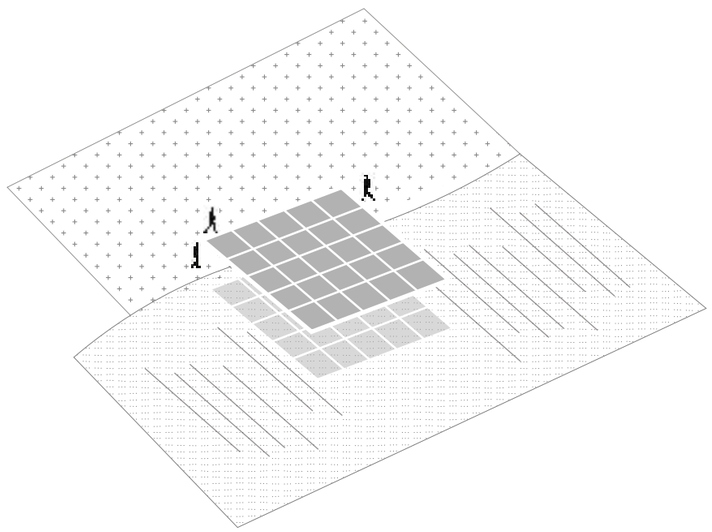


3

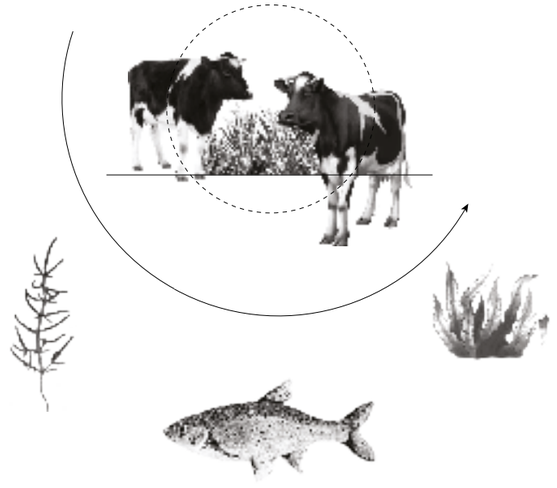
macroalgae (seaweed)
plantation

The experiment
Systemic interrelation

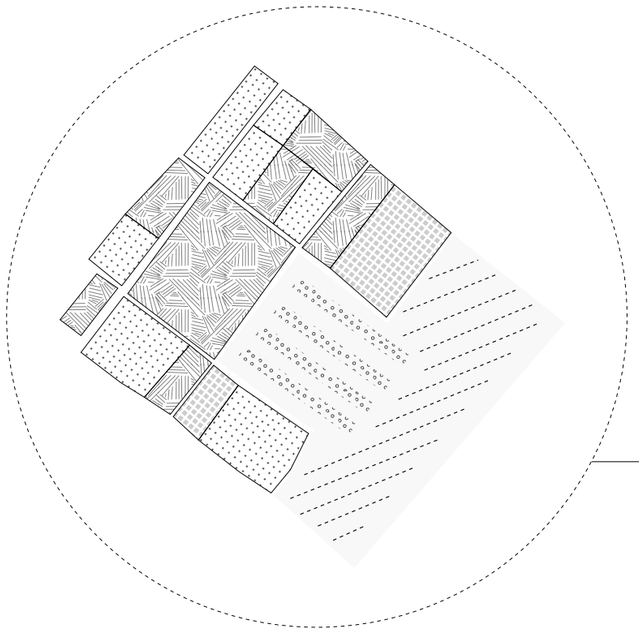
Floating hubs
(controlling & processing facilities)



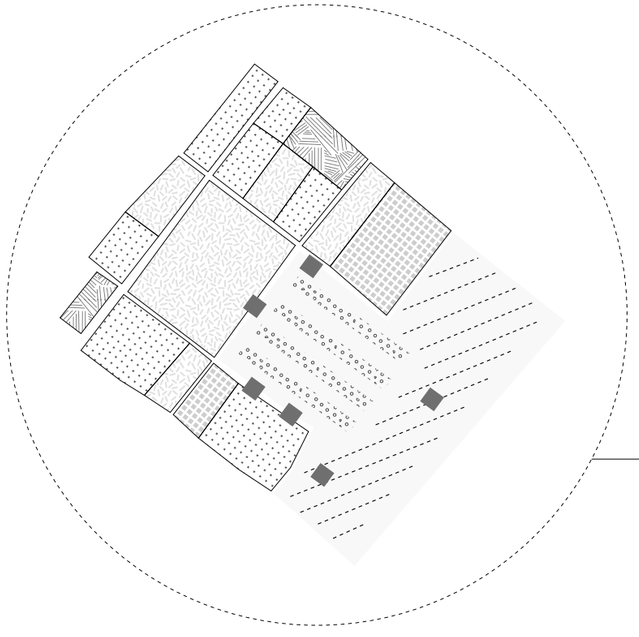
apart from controlling and processing the flows the hub informs the visitors about the content, raising awareness



Re - orientation of the agricultural and pasture landscapes towards aquaculture, seaweed cultivation & saline agriculture



3
macroalgae (seaweed)
plantation



4
salt tolerant
crop plantation &
floating hubs

The experiment
Mussel pole fields

Mussel pole fields

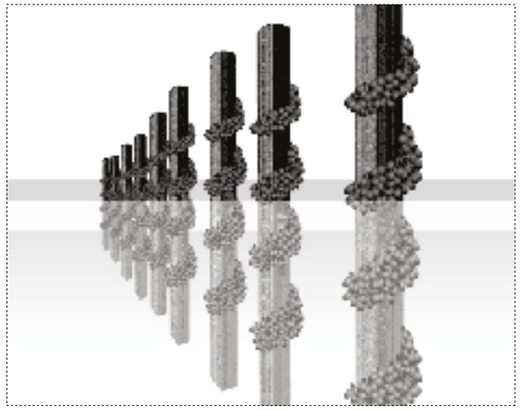
○ existing stakeholders ● new local presence <- - -> link enhancement <- - -> reason for new link

- ○ EU governing bodies (e.g. Natura 2000)
- ○ National government
- ○ Rijkswaterstaat
- ○ Provincial administration
- ○ Texel municipality
- ○ Local port / marina authorities
- ○ Local transport authorities
- ○ Local tourist authorities

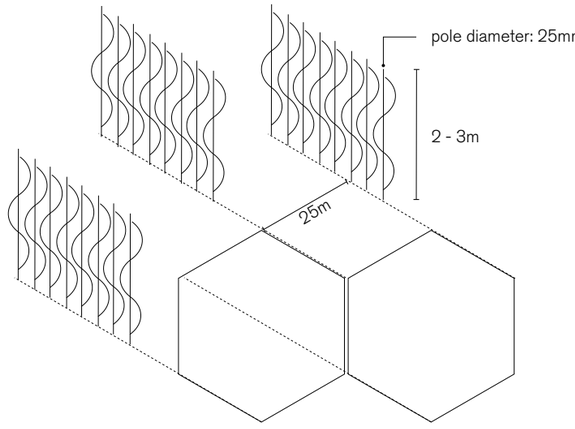
- ○ Landowners (incl. traditional agriculture & pasture)
- ○ Local residents
- ● Mussel farming cooperatives
- ● Agro / food operations
- ○ Local tourism operators / providers
- ○ Local restaurants / food markets
- ○ Local wildlife conservation groups
- ○ Freight / logistics businesses
- ● Other local entrepreneurs
- ○ Marine / sailing recreation groups

- ○ University research institutes
- ○ Private research institutes (e.g. Deltares)
- ● Innovation floating hubs
- ○ Other research institutes (e.g. NIOZ)

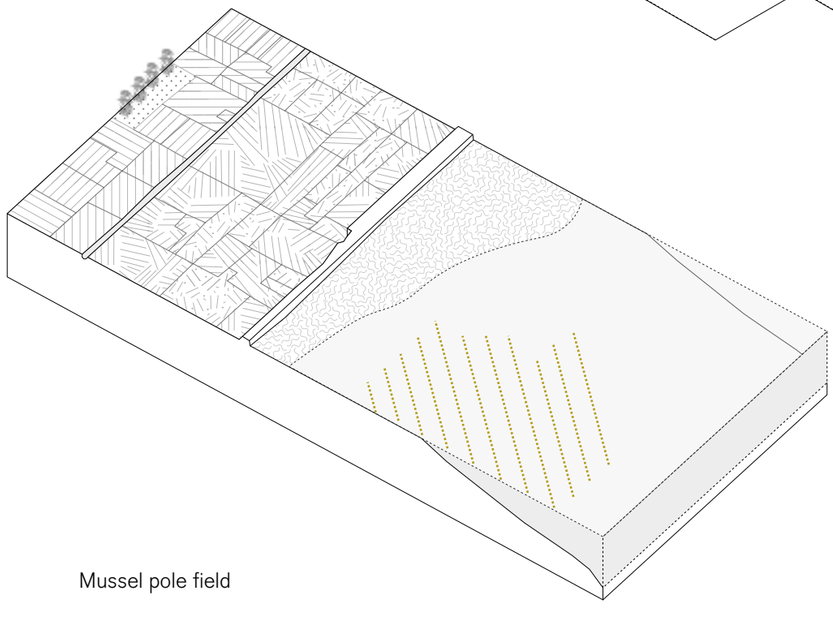
Blue Mussel (Mitilus edulis)



Mussel poles with nets containing the mussel crop arranged in a spiral



Mussel pole arrays



Mussel pole field

The experiment
Oyster reefs

Oyster reefs

existing stakeholders · new local presence · link enhancement · reason for new link

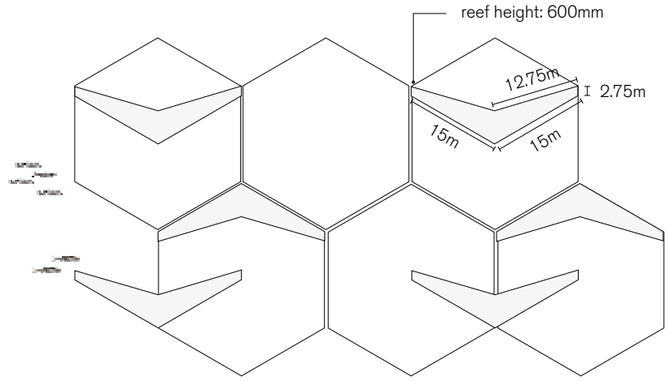
- EU governing bodies (e.g. Natura 2000)
- National government
- Rijkswaterstaat
- Provincial administration
- Texel municipality
- Local port / marina authorities
- Local transport authorities
- Local tourist authorities
- Oyster reef monitoring / administration bodies

- Landowners (incl. traditional agriculture & pasture)
- Local residents
- Marine / sailing recreation groups
- Local tourism operators / providers
- Local restaurants / food markets
- Local wildlife conservation groups
- Freight / logistics businesses
- Other local entrepreneurs

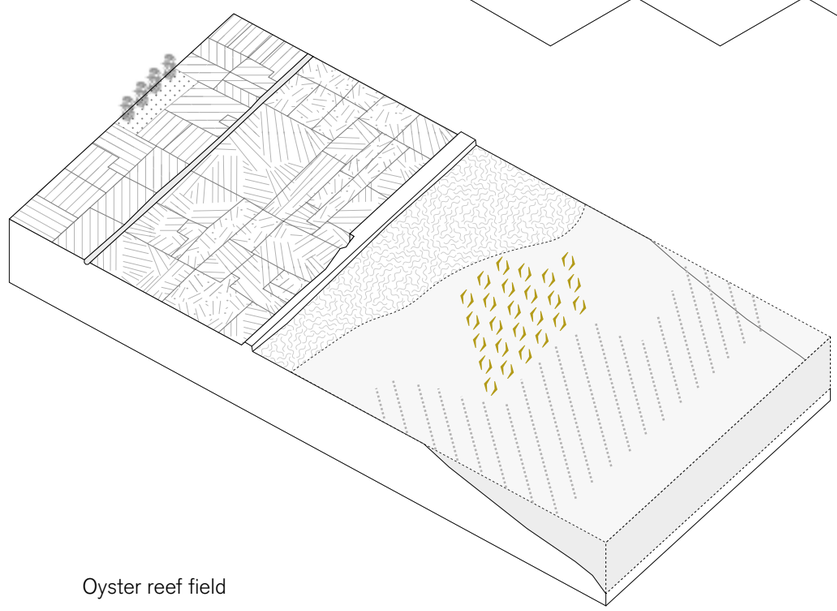
- University research institutes
- Private research institutes (e.g. Deltares)
- Innovation floating hubs
- Other research institutes (e.g. NIOZ)

Pacific Oyster (Crassostrea gigas)

Naturally occurring oyster reefs
https://www.nature.org/en-us/newsroom/oyster-reef-restoration/



Oyster reef spatial organisation



Oyster reef field

The experiment
Macro algae (seaweed) plantation

Macroalgae Plantations

existing stakeholders · new local presence · link enhancement · reason for new link

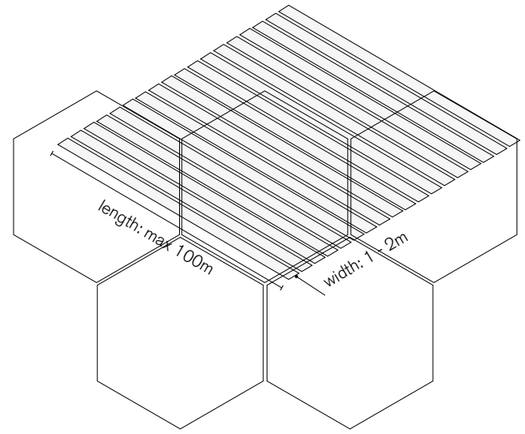
- EU governing bodies (e.g. Natura 2000)
- National government
- Rijkswaterstaat
- Provincial administration
- Texel municipality
- Local port / marina authorities
- Local tourist authorities

- Local power generation operations
- Landowners (incl. traditional agriculture & pasture)
- Local residents
- Macroalgae farming and processing
- Aquaculture operations
- Agro / food operations
- Local tourism operators / providers
- Local wildlife conservation groups
- Freight / logistics businesses
- Other local entrepreneurs
- Marine / sailing recreation groups

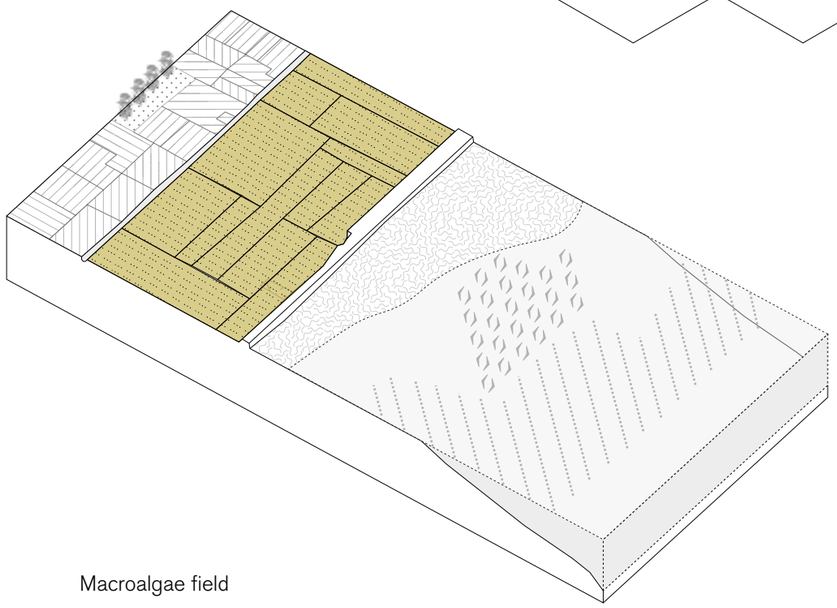
- University research institutes
- Private research institutes (e.g. Deltares)
- Innovation floating hubs
- Other research institutes (e.g. NIOZ)

Sea Lettuce (Ulva lactuca)

Seaweed plantation
https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0219958&type=printable



Macroalgae field
spatial organisation



Macroalgae field

The experiment
Salt tolerant crop field

Salt marsh meadows

○ existing stakeholders ● new local presence <- - -> link enhancement <- - -> reason for new link

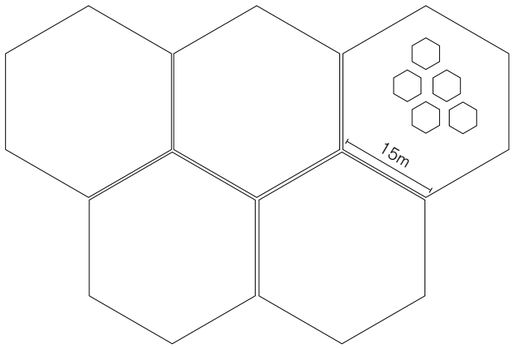
- EU governing bodies (e.g. Natura 2000)
- National government
- Rijkswaterstaat
- Provincial administration
- Texel municipality
- Local port / marina authorities
- Local transport authorities
- Local tourist authorities

- Landowners (incl. traditional agriculture & pasture)
- Local residents
- Salt marsh farming cooperatives
- Aquaculture operations
- Agro / food operations
- Local tourism operators / providers
- Local restaurants / food markets
- Local wildlife conservation groups
- Freight / logistics businesses
- Other local entrepreneurs

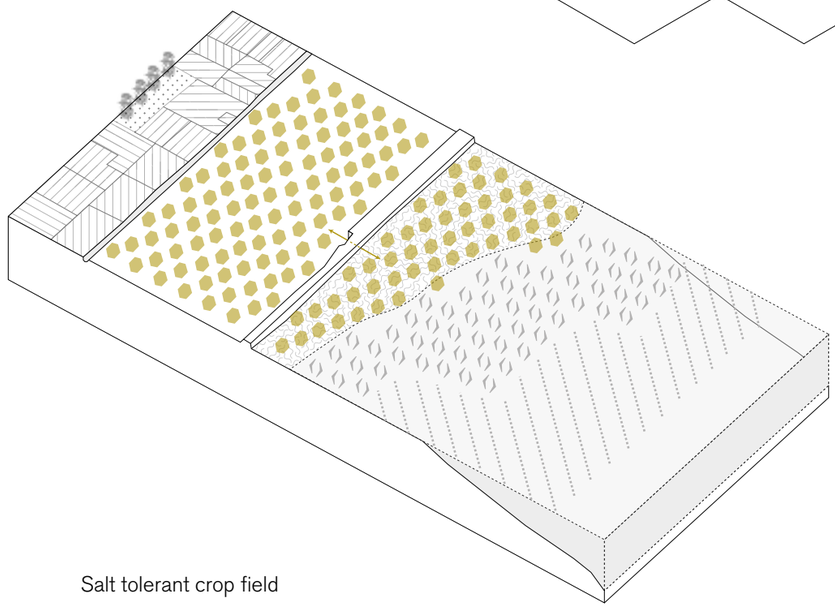
- University research institutes
- Private research institutes (e.g. Deltares)
- Innovation floating hubs
- Other research institutes (e.g. NIOZ)

Salicornia europaea (Samphire)

Salt tolerant crop cultivation
http://hortadospeixinhos.com/en/salicornia/



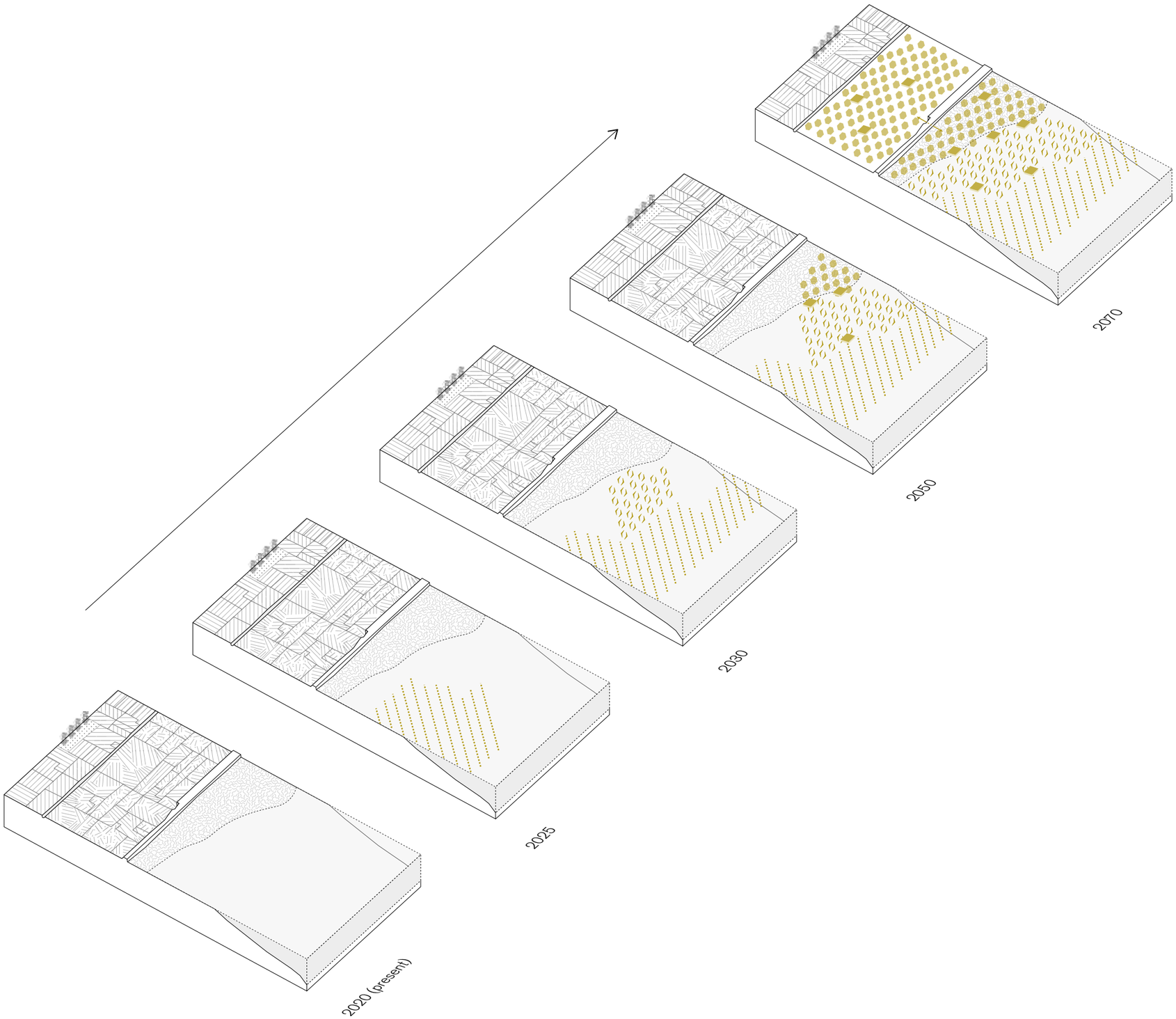
Microalgae field
spatial organisation



Salt tolerant crop field

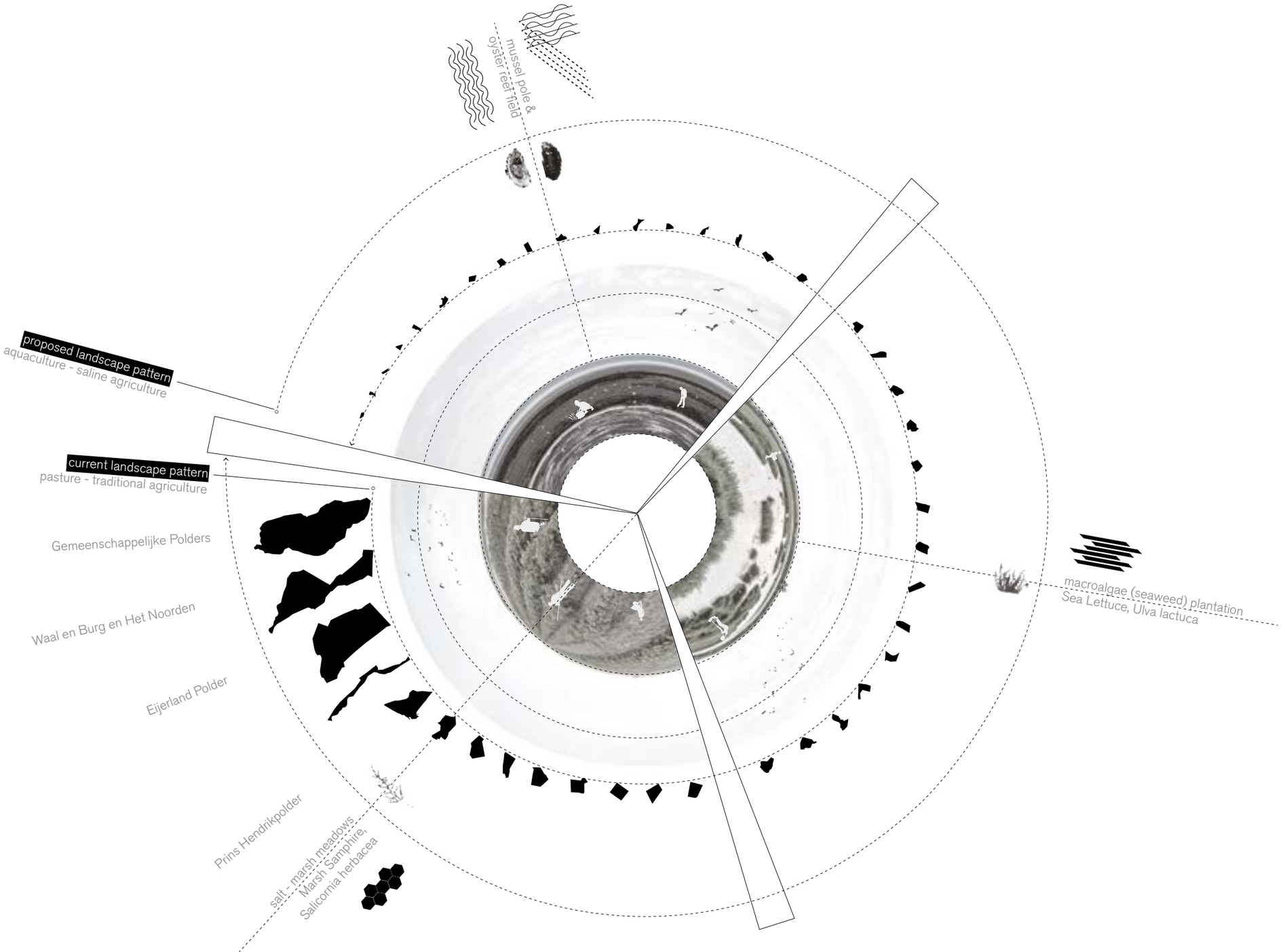
The experiment

Timeline



The experiment

Reprogramming the land use



The experiment
Living lab

process link enhancement

programmatic

Governance — Main Gov. Body — Joint Masterplan — Strategic Planning — Policies

R & D — University Research — Pilot projects — Innovation incentives — Private research — Feasibility Study — Survey needs

Funding — EU funding — Subsidies — Tax Relief — Private investments — Public investments

Eucation & Awareness — Marketing — Social Media — Farmers Education — University courses — Employees Training — Consultation

salt tolerant crops
macro / micro algae
reflooding

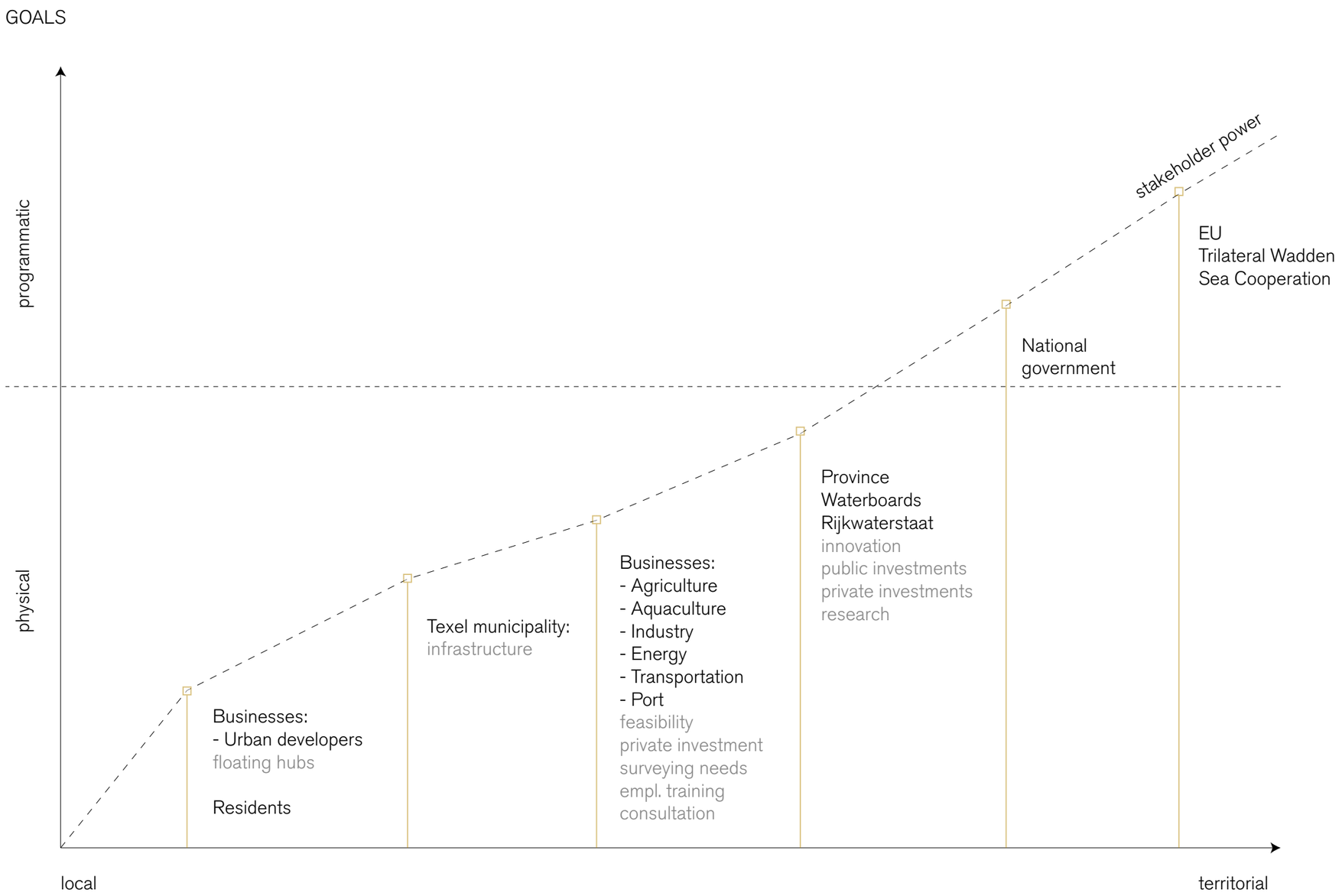
physical

Aquaculture / Agriculture — Salt marsh meadows — Vegetation Production — Aquaculture

Infrastructural Upgrade — Water infrastructure

Construction development — Floating Hubs

The experiment
Living lab



The experiment
Co - habitation

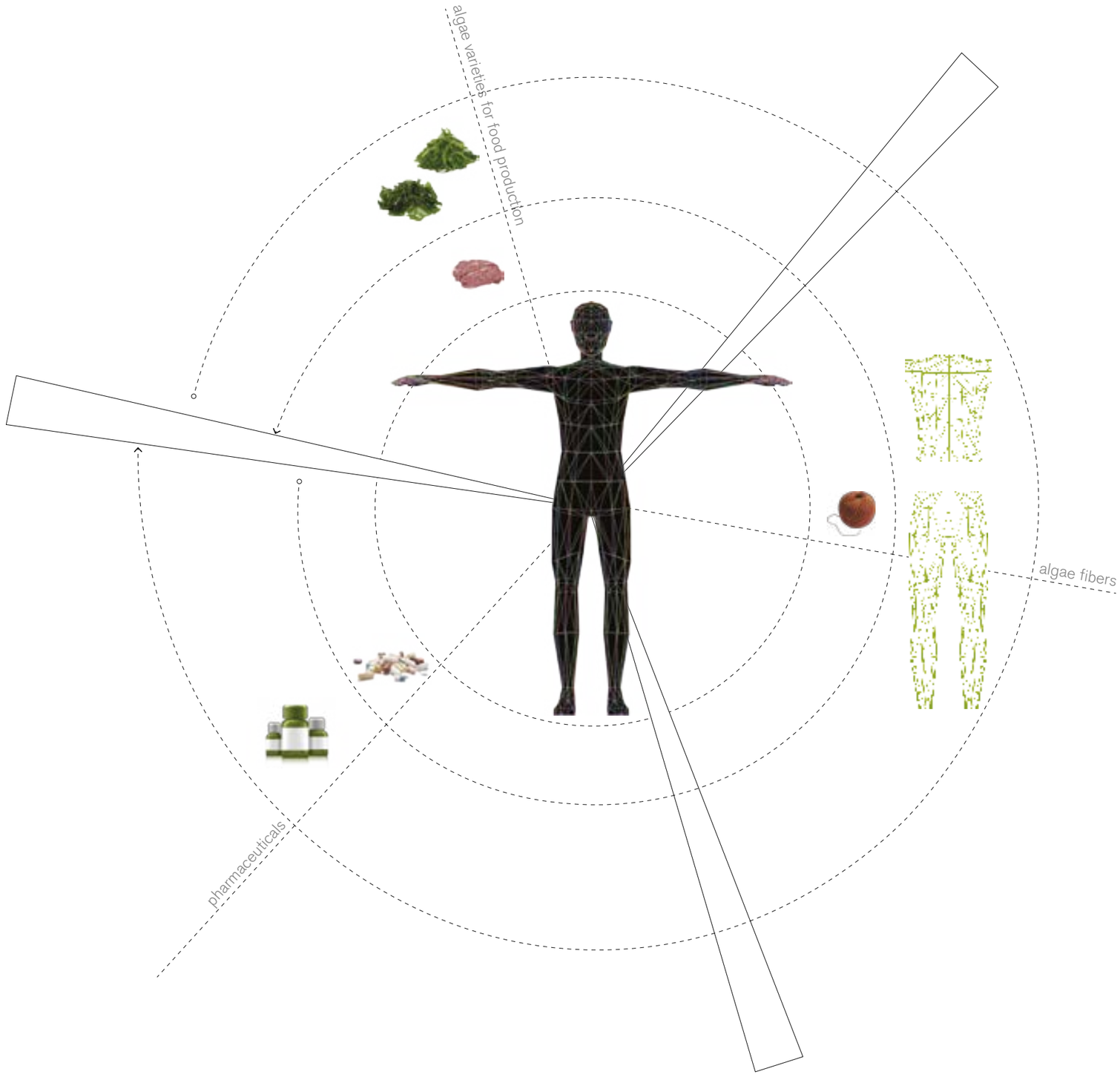
The experiment

New wetland

The experiment
Nomadic territories

The experiment

Nano scale

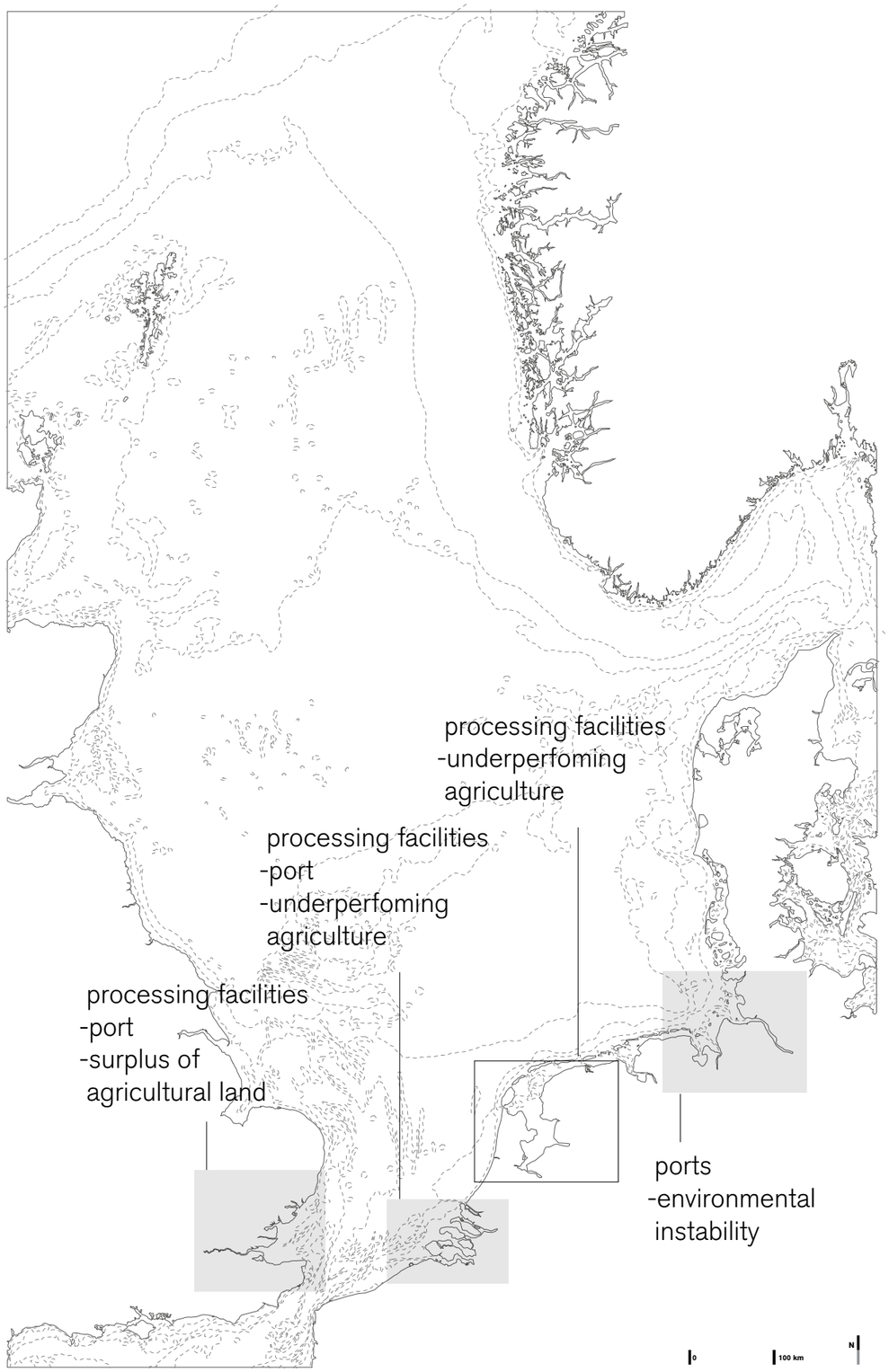


7

Conclusions

Conclusions

Limitations - Upscaling



Conclusions
Transferability

References
Maps

- Findings conclusion
Source: RiseEuropean Environment Agency (2017) Climate change adaptation and disaster risk reduction in europe : enhancing coherence of the knowledge base, policies and practices. Luxembourg: Publications Office of the European Union (EEA report, No 15/2017). doi: 10.2800/88971.
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Thank you!