



CROSSING THE LINE FOR NATURE

CROSS BORDER PLANNING COLLABORATION TO IMPLEMENT ECOSYSTEM-BASED ADAPTATION

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Second mentor: Janneke van Bergen
Date: 04/07/2019

PROBLEM STATEMENT



FLOOD RISK (1M SEA LEVEL RISE)

DEALING WITH CLIMATE CHANGE AND RELATED RISKS

INCREASING OUR ADAPTIVE CAPACITY

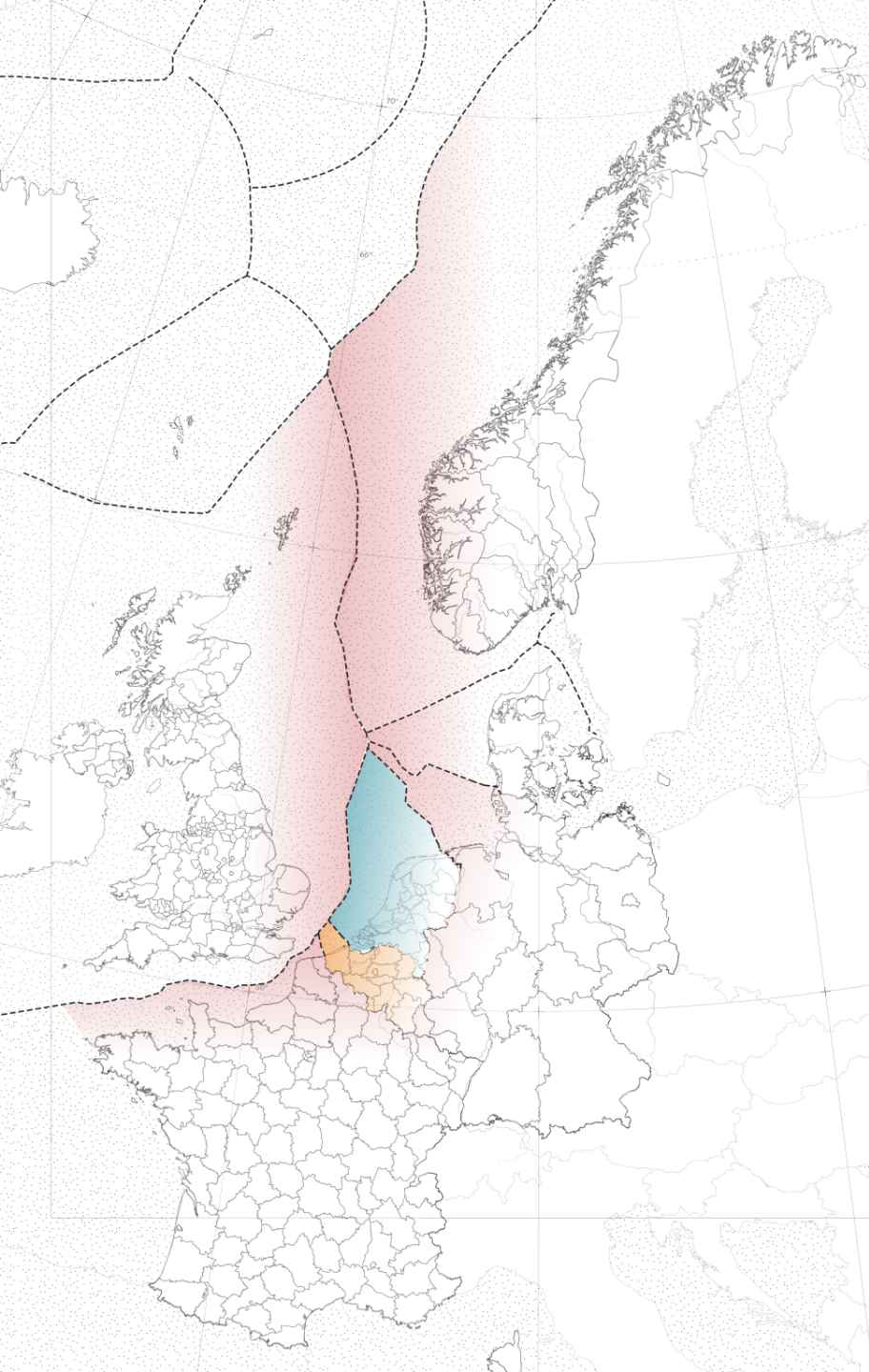
PROBLEM STATEMENT



INCREASING AWARENESS AND
UNDERSTANDING OF NATURE VALUES AND
POTENTIAL FOR ADAPTATION

ECOSYSTEM BASED ADAPTATION:

“THE USE OF BIODIVERSITY AND ECOSYSTEM SERVICES (BES) AS PART OF AN OVERALL ADAPTATION STRATEGY TO HELP PEOPLE TO ADAPT TO THE ADVERSE EFFECTS OF CLIMATE CHANGE” (CBD, 2009).



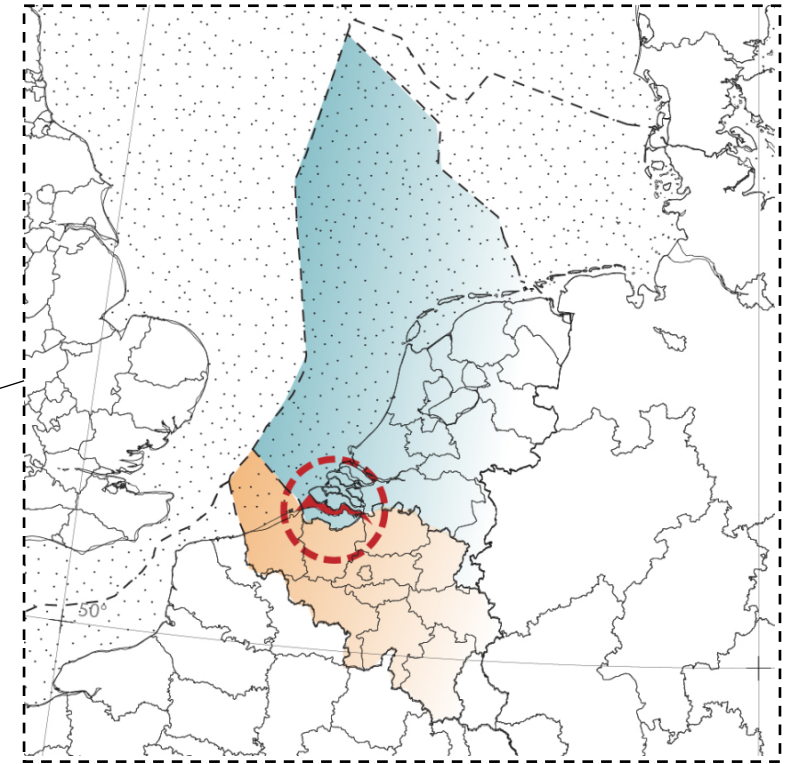
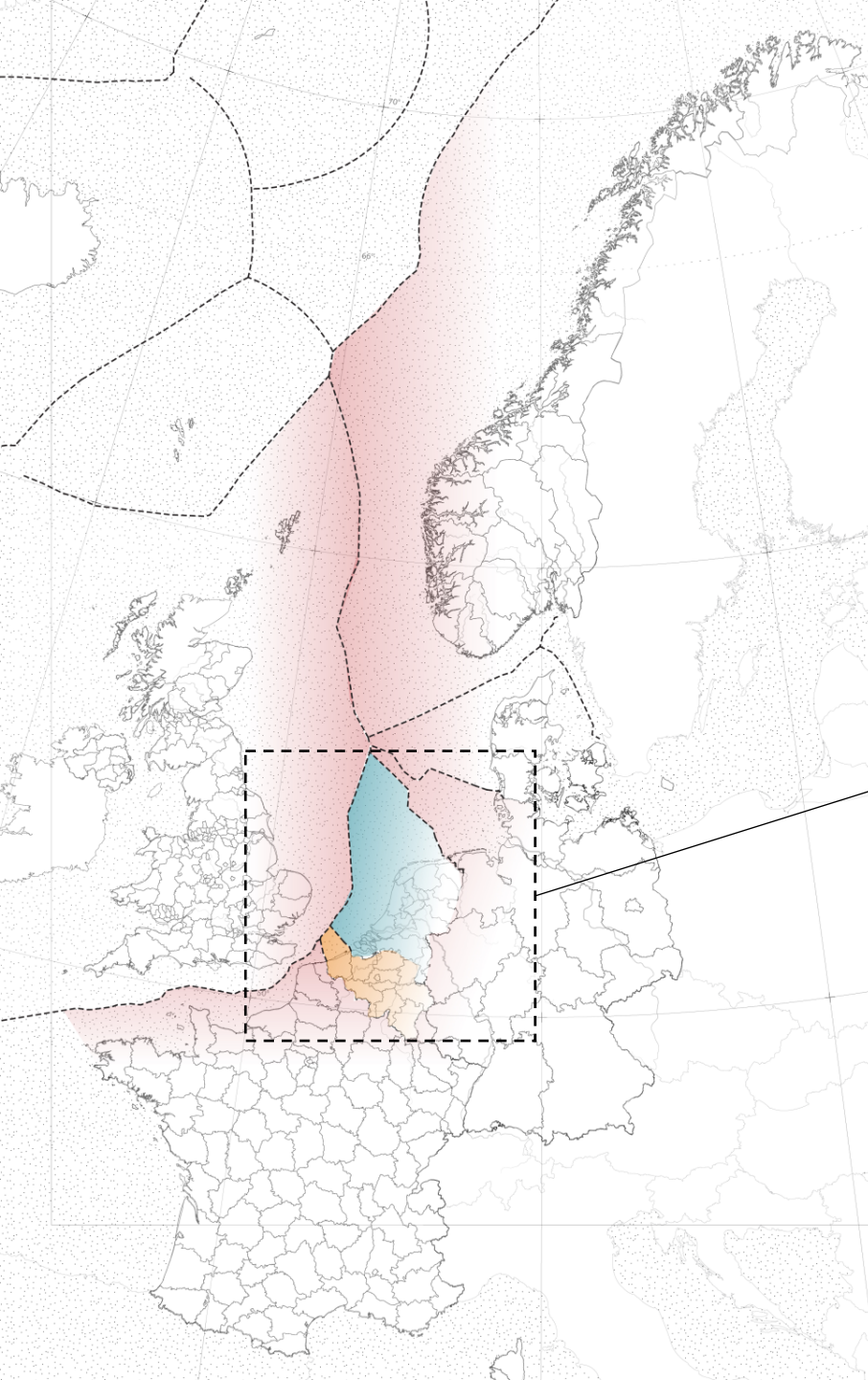
PROBLEM STATEMENT: BORDERS AND GOVERNANCE LIMITATIONS

EXTENSION OF ECOSYSTEMS AND THEIR PROCESSES



TRADITIONAL POLITICAL AND ADMINISTRATIVE BOUNDARIES

CASE STUDY SELECTION: THE WESTERN SCHELDT

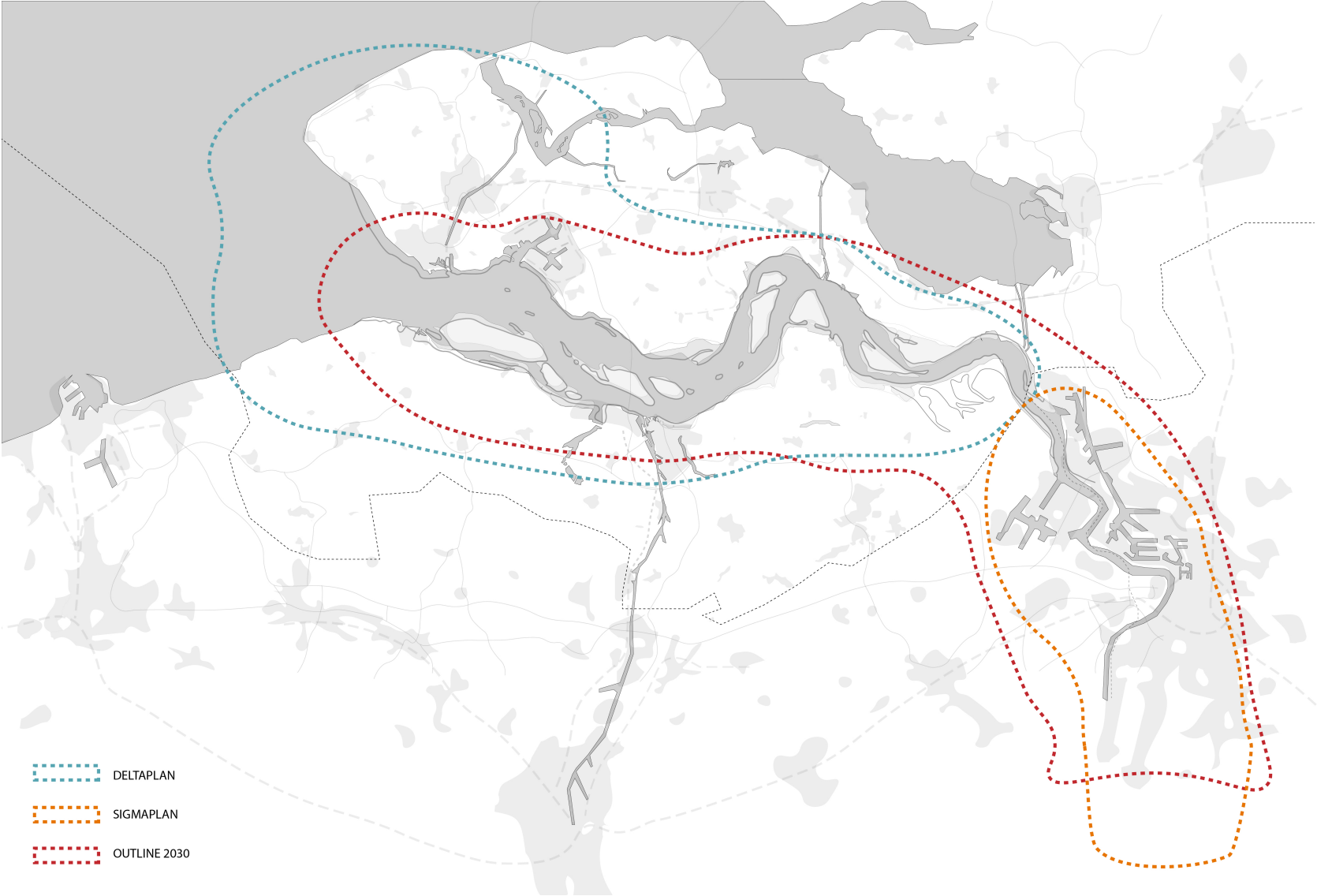


OPEN ARM OF THE RHINE-MEUSE-SCHELDTS DELTA

HIGH ECOLOGICAL VALUES - HIGH POTENTIAL FOR EBA

2 COUNTRIES INVOLVED IN THE DECISION-MAKING

CROSS BORDER INITIATIVES

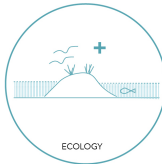
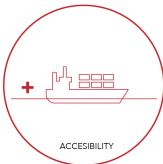


- DELTAPLAN
- SIGMAPLAN
- OUTLINE 2030

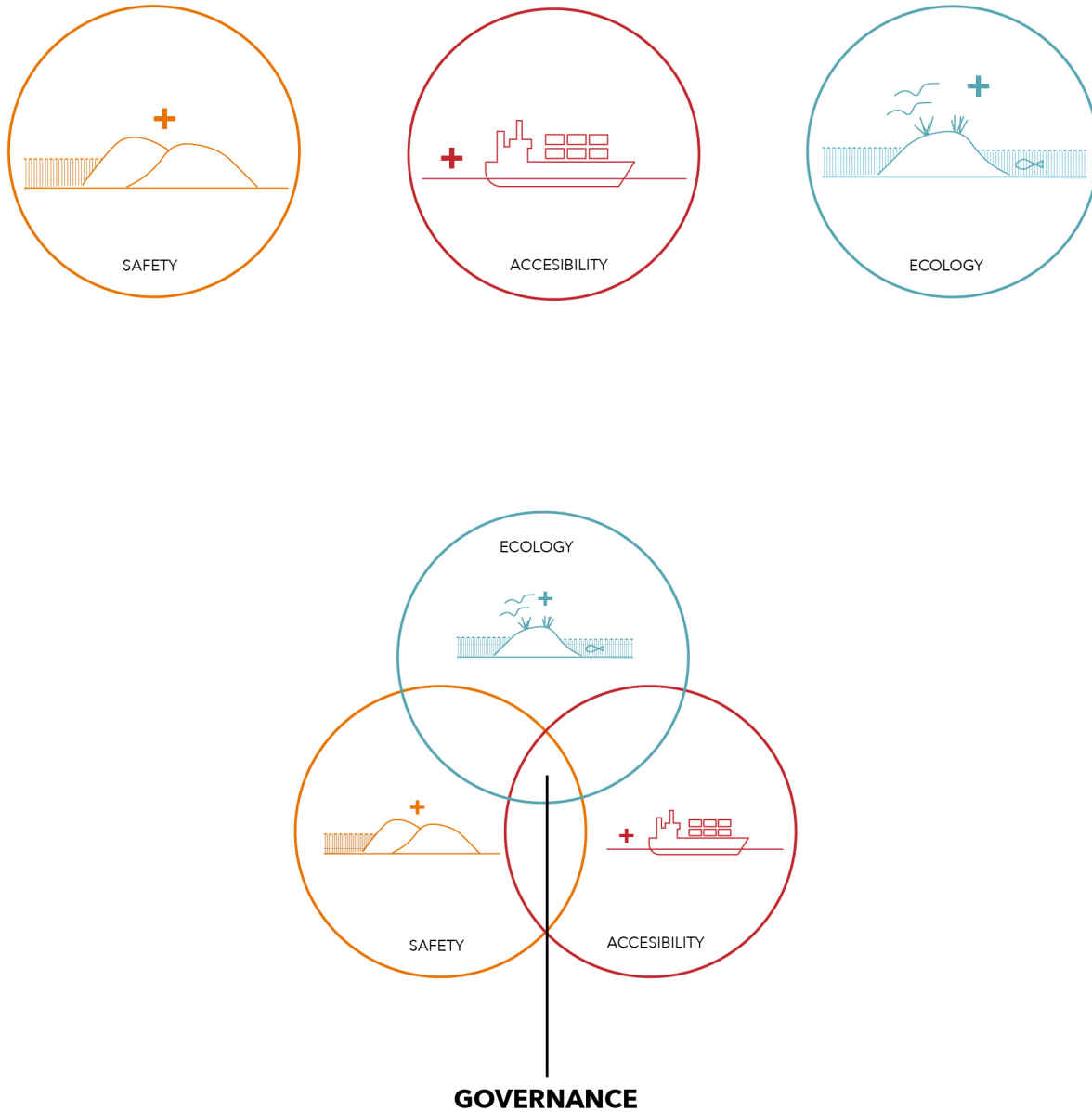
WESTERN-SCHELDT COMMISSION

DEVELOPMENT OF THE OUTLINE 2010 AND
LONG-TERM VISION 2030 OF THE WESTERN
SCHELDT

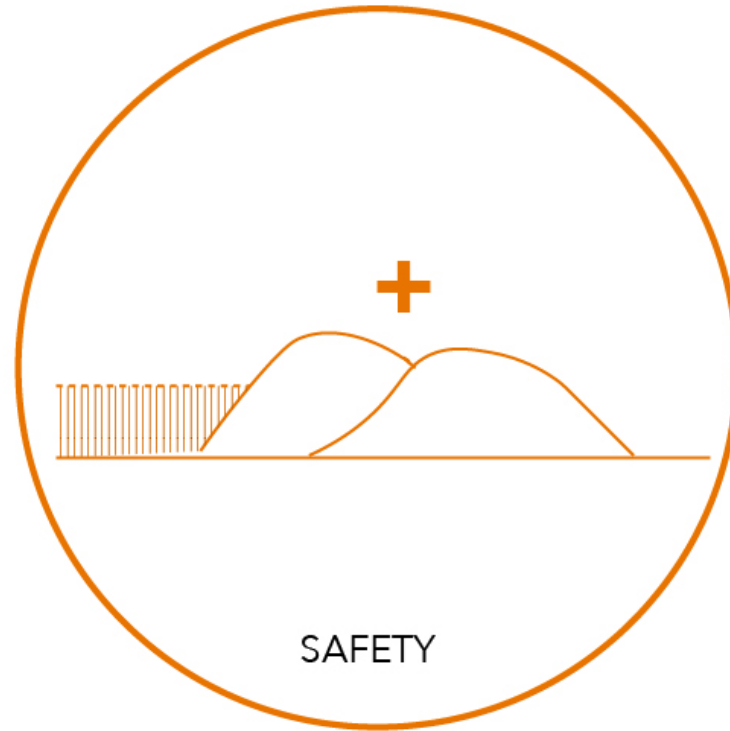
GOALS 2030



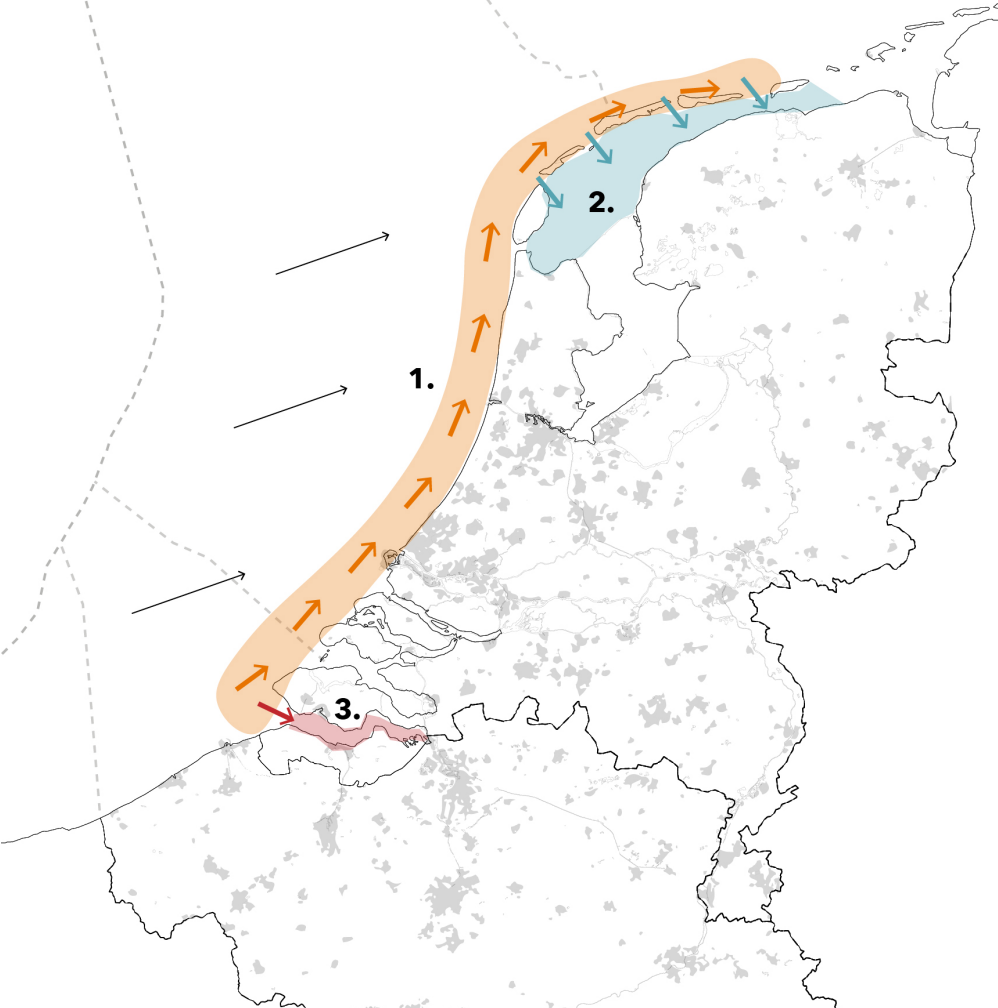
RESEARCH QUESTION



“HOW CAN EBA PLAY A ROLE IN THE SUSTAINABLE DEVELOPMENT OF THE WESTERN SCHELDT, AND HOW CAN CROSS-BORDER COLLABORATION IN PLANNING BE ADJUSTED TO FACILITATE THE IMPLEMENTATION OF EBA STRATEGIES?”

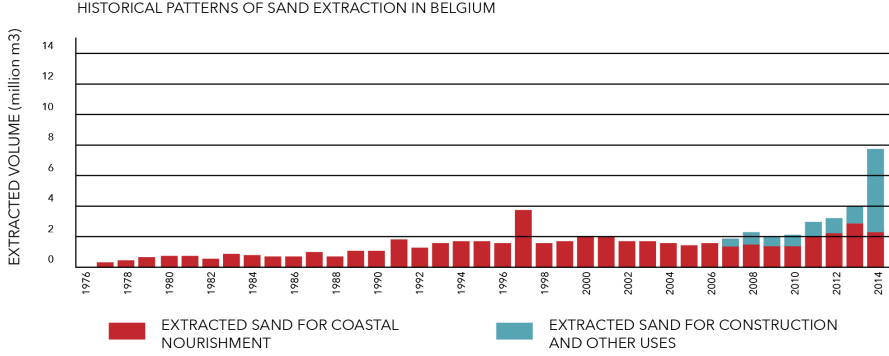
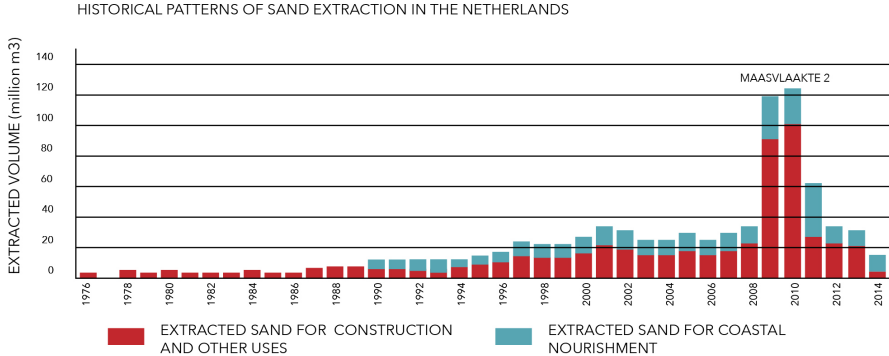


BIOPHYSICAL ASSESSMENT: SAFETY



SAND DEMANDS IN RELATION TO SEA LEVEL RISE (NL)

PROJECTED SEA LEVEL RISE (m)	0.18	0.60	0.85	2.00
1. COASTLINE	+ 7.0	+ 23.0	+ 33.0	+ 77.0
2. WADDEN SEA	+ 4.5	+ 15.0	+ 21.0	+ 50.0
3. WESTERN SCHEDLT	+ 0.5	+ 1.7	+ 2.4	+ 5.7
TOTAL SAND REQUIRED	+12.0	+ 39.7	+ 56.4	+ 132.7

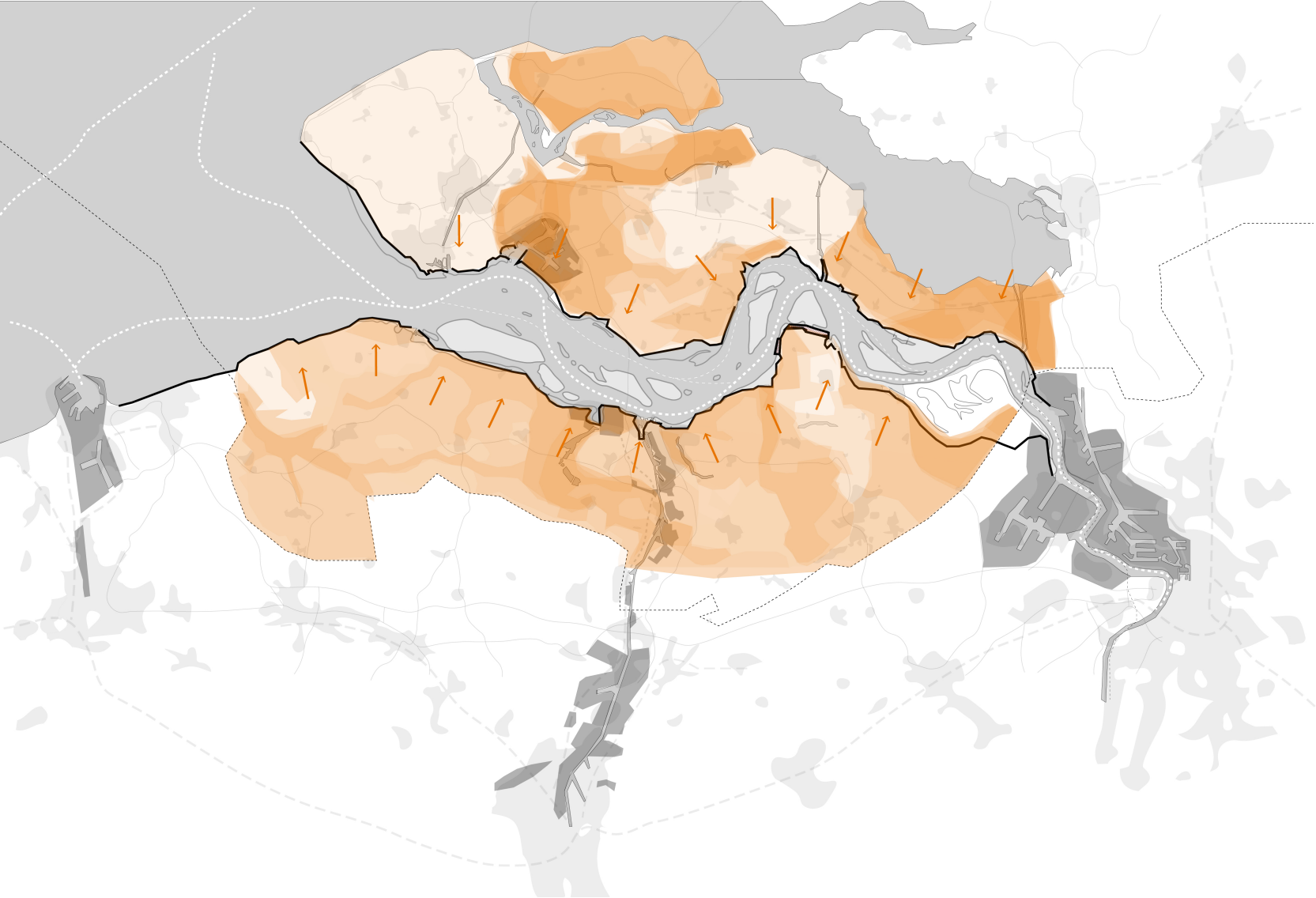


SEA LEVEL RISE

NEGATIVE SEDIMENT BALANCE

INCREASING COASTAL NOURISHMENT

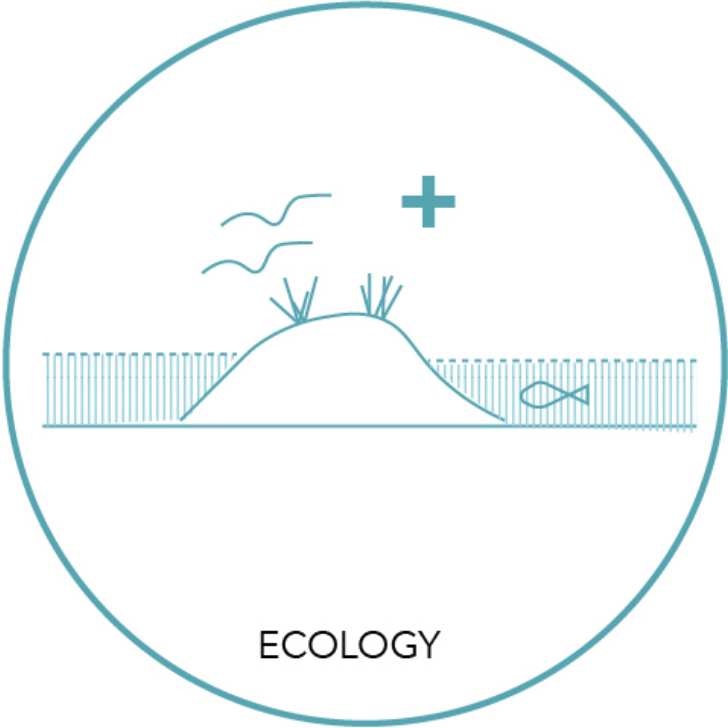
BIOPHYSICAL ASSESSMENT: SAFETY



- BEFORE 1200
- 1200 - 1300
- 1300 - 1400
- 1400 - 1500
- 1500 - 1600
- 1600 - 1700
- 1700 - 1800
- 1800 - 1900
- 1900 - 2000
- DIKES

LAND RECLAMATION AND
REDUCTION OF RIVER SPACE

INCREASING EROSION, TIDAL RANGE
AND WAVE INTENSITY

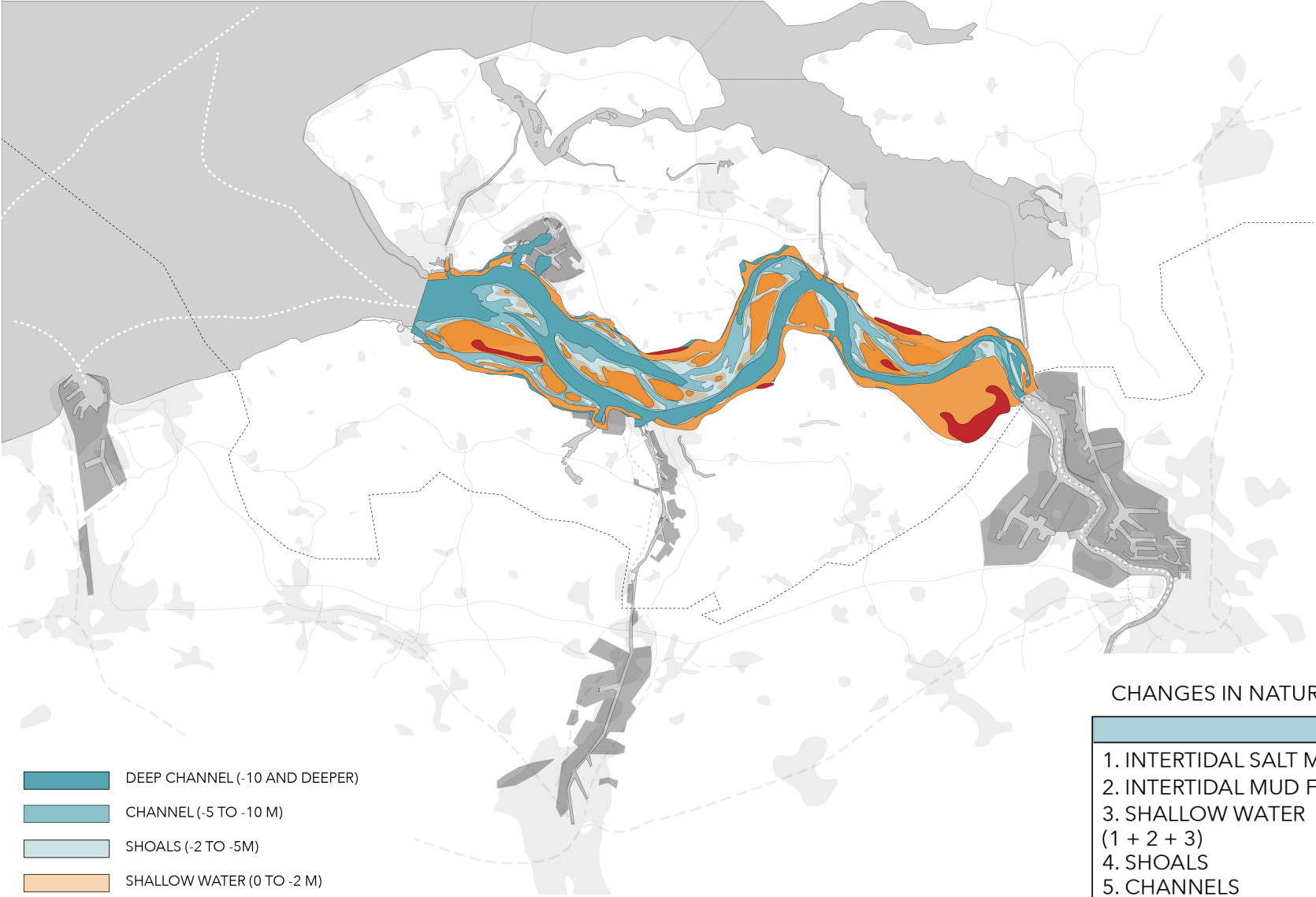


ECOSYSTEM SERVICES IN THE WESTERN SCHELDT:

- PROVISIONING: FOOD SOURCES, SPECIALLY FISH, SHRIMPS, MUSSELS, SAND FOR EXTRACTION
- REGULATING: WAVE DISSIPATION, EROSION REDUCTION, SOIL STABILIZATION, CO₂ RETENTION, FILTER
- CULTURAL: RECREATIONAL, EDUCATIONAL, HERITAGE
- SUPPORTING: BIODIVERSITY CONSERVATION



BIOPHYSICAL ASSESSMENT: ECOLOGY

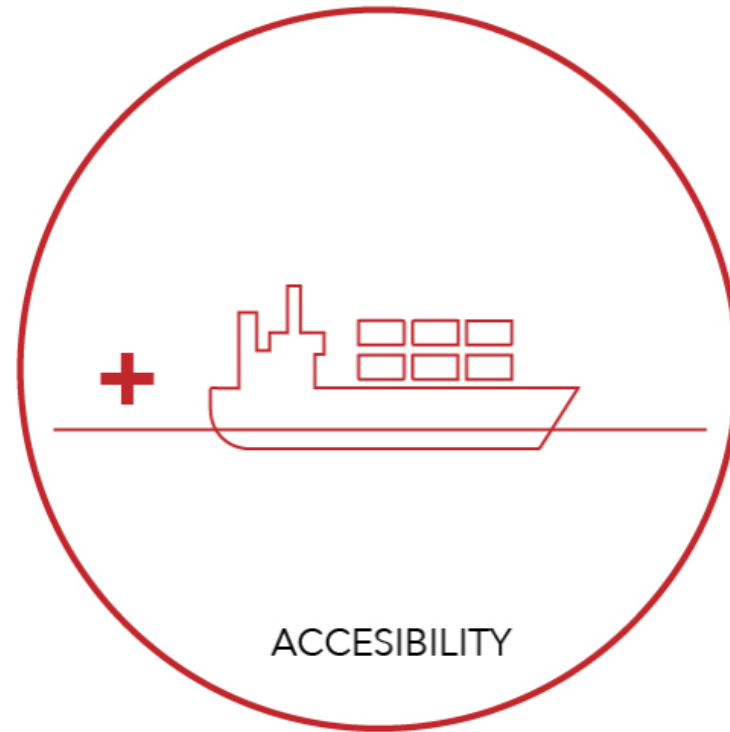


LOSS OF VALUABLE HABITATS OVER TIME

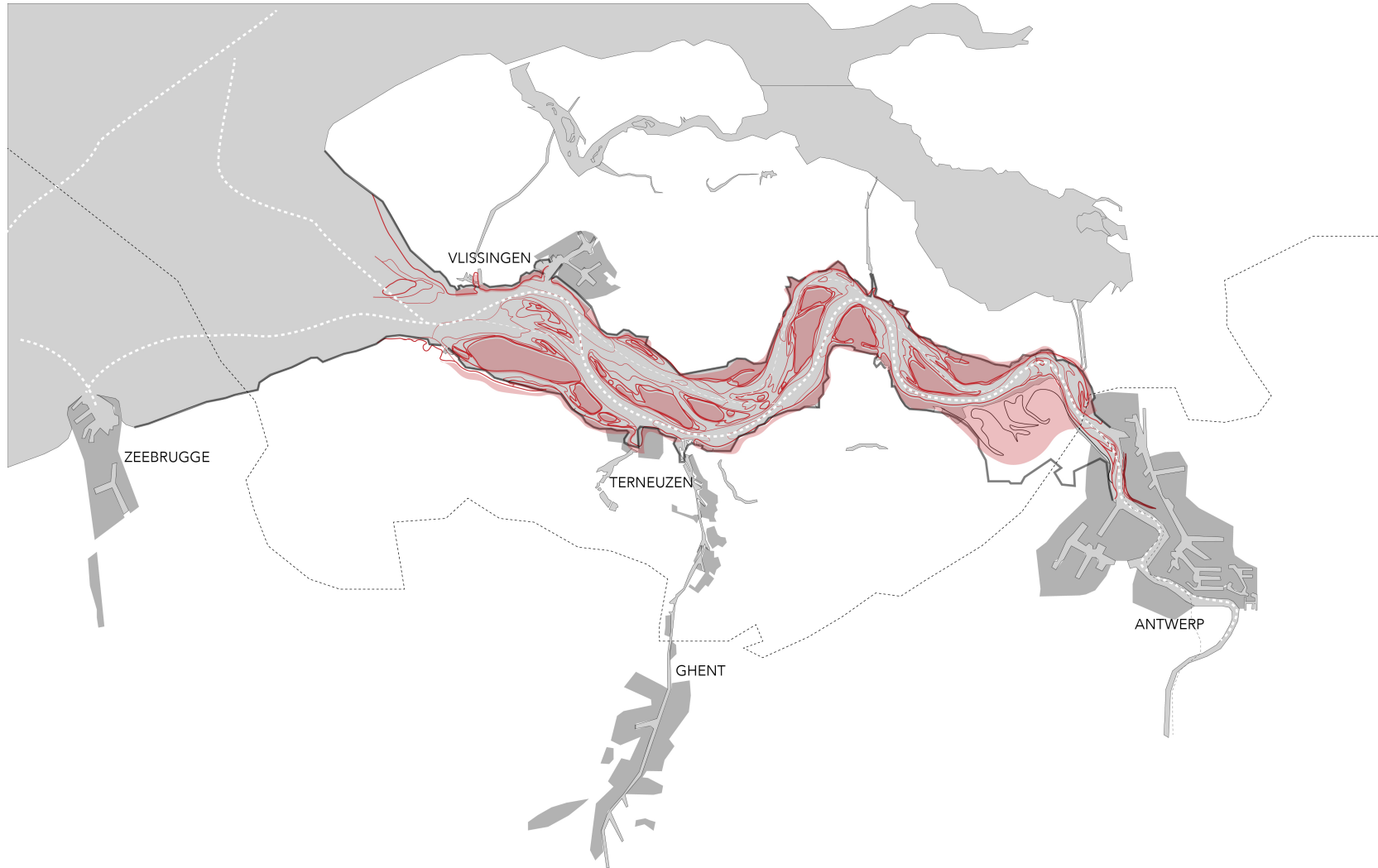
- DEEP CHANNEL (-10 AND DEEPER)
- CHANNEL (-5 TO -10 M)
- SHOALS (-2 TO -5M)
- SHALLOW WATER (0 TO -2 M)
- MUDFLATS (0 TO +2M)
- ESTUARIES (+2 AND HIGHER)

CHANGES IN NATURAL SURFACE AREA IN WESTERN SCHELDT

	1960	1990	2018	CHANGE
1. INTERTIDAL SALT MARSHES	3.520	2.540	2.350	-1.170
2. INTERTIDAL MUD FLATS	4.260	3.330	3.290	-970
3. SHALLOW WATER	4.450	3.170	3.110	-1.360
(1 + 2 + 3)	12.230	9.040	8.750	-3.500
4. SHOALS	4.480	4.930	4.960	+510
5. CHANNELS (DEEP CHANNELS)	16.160	16.960	17.600	+1440
TOTAL	32.870	30.930	30.410	-2.460



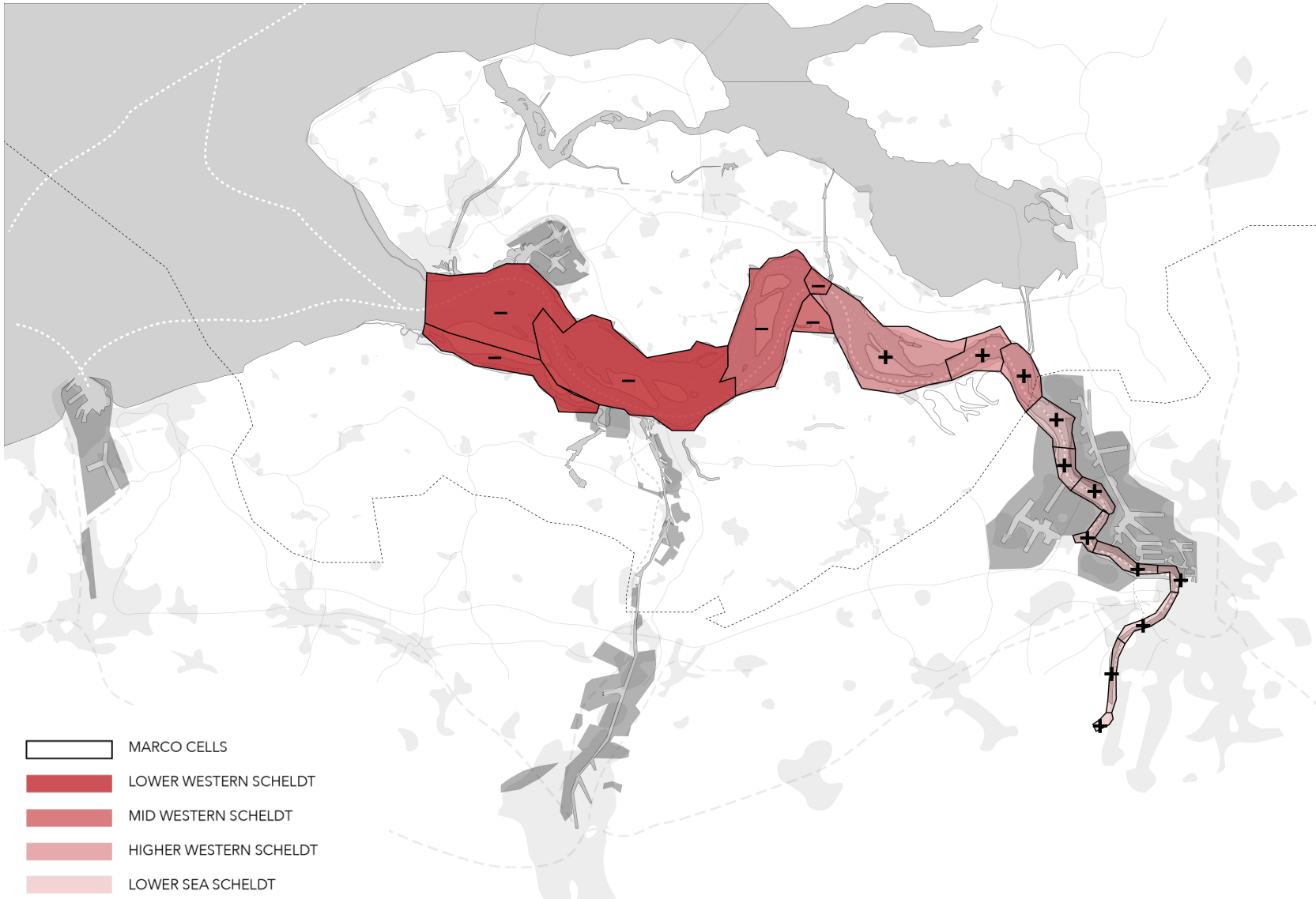
BIOPHYSICAL ASSESSMENT: ACCESSIBILITY



NATURAL CHANNELS USED FOR NAVIGATION

ENLARGEMENT TO MAKE ROOM FOR SHIPS

BIOPHYSICAL ASSESSMENT: ACCESSIBILITY

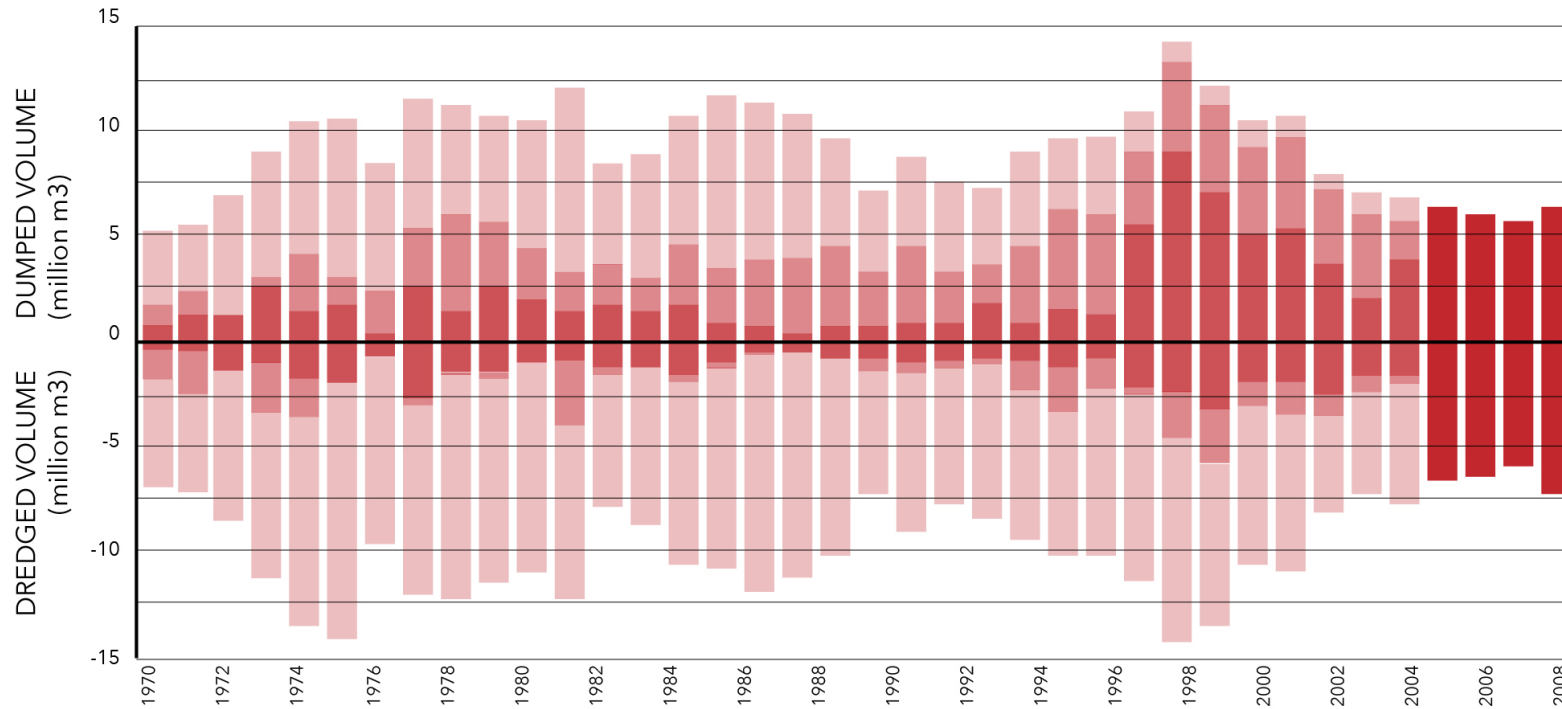


- MARCO CELLS
- LOWER WESTERN SCHELDT
- MID WESTERN SCHELDT
- HIGHER WESTERN SCHELDT
- LOWER SEA SCHELDT
- NEGATIVE SEDIMENT BALANCE
- + POSITIVE SEDIMENT BALANCE

DETAILED SEDIMENT BALANCE
ACCUMULATION IN HIGH AREAS LED TO
OBSTRUCTION OF THE CHANNELS

BIOPHYSICAL ASSESSMENT: ACCESSIBILITY

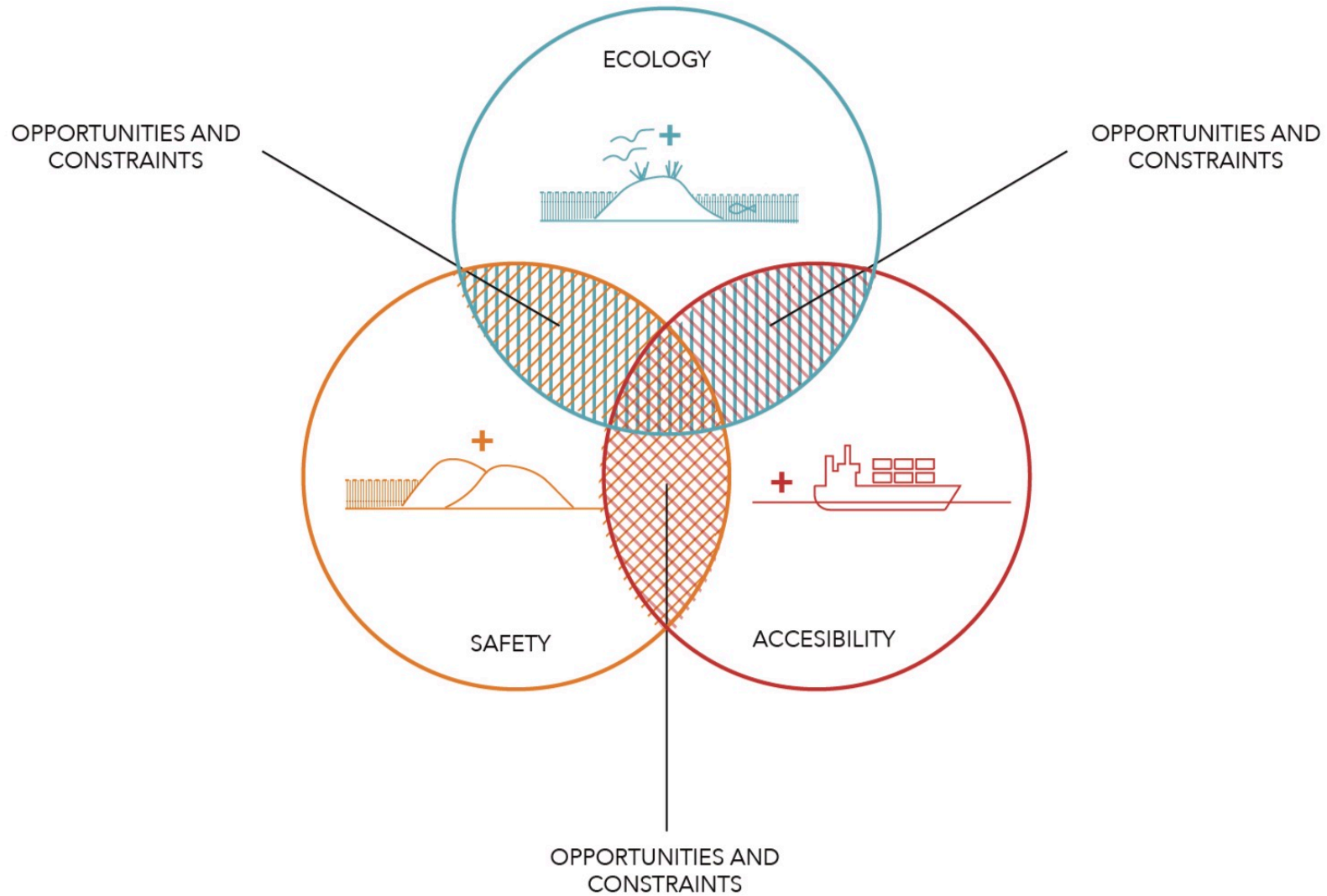
HISTORICAL PATTERNS OF SAND EXTRACTION IN THE WESTERN SCHELDT



- LOWER WESTERN SCHELDT
- MID WESTERN SCHELDT
- HIGHER WESTERN SCHELDT

EVOLUTION IN DREDGING ACTIVITIES

BIOPHYSICAL ASSESSMENT: CONCLUSION



INTERDEPENDENCY OF THE SYSTEMS

GOVERNANCE ASSESSMENT: 2 PLANNING SYSTEMS

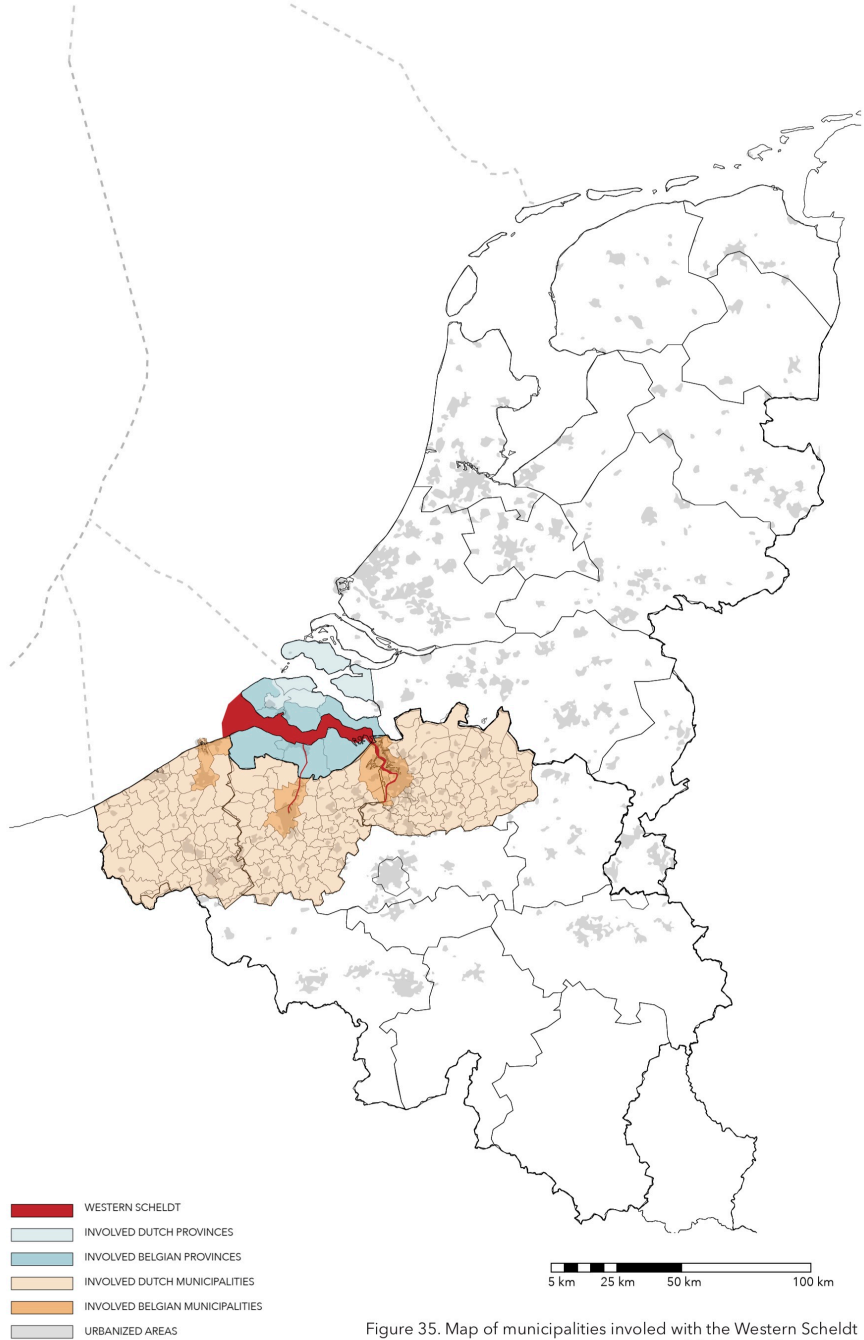


Figure 35. Map of municipalities involved with the Western Scheldt (Elaborated by author.)

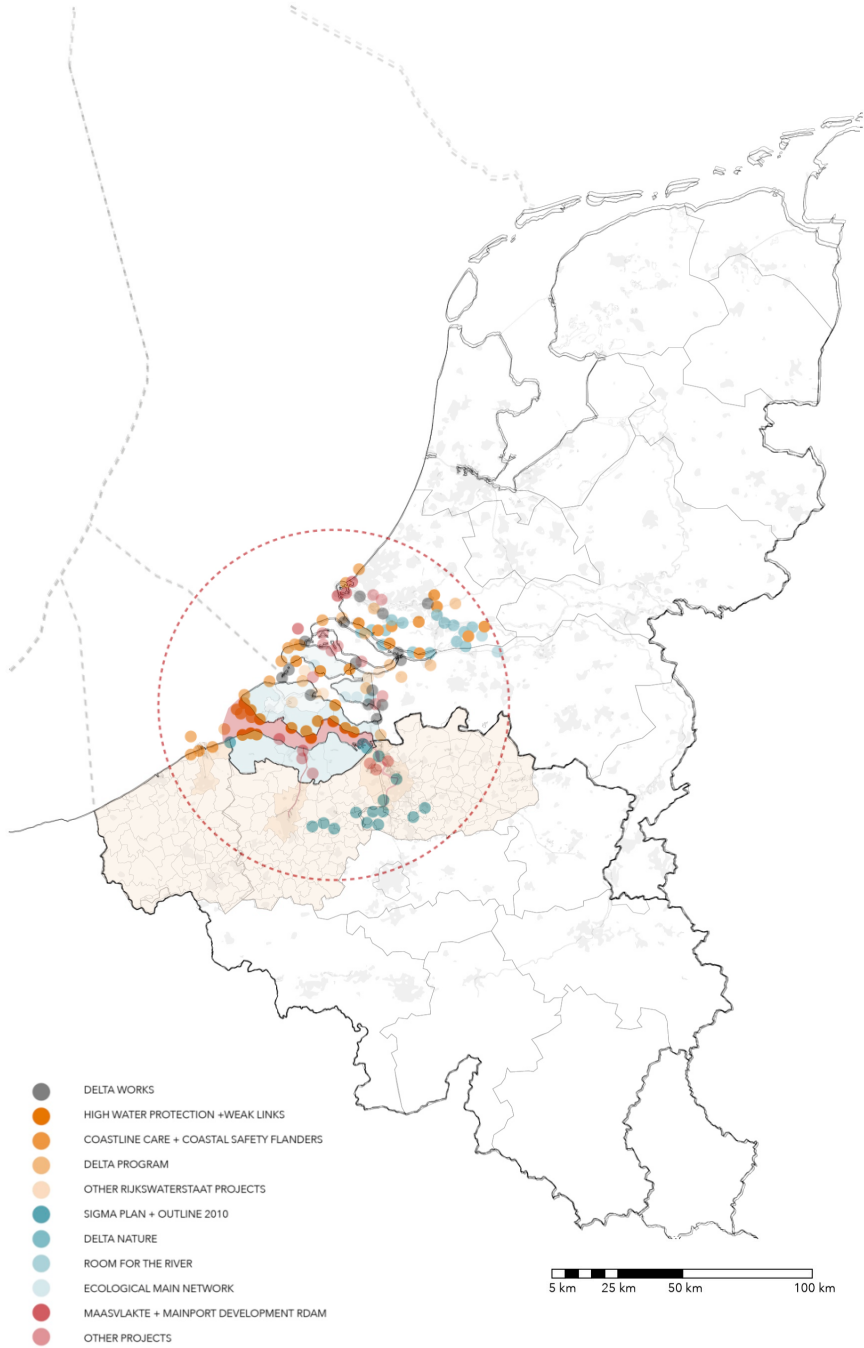
	NETHERLANDS	BELGIUM (FLANDERS)
DIFFERENCES	<ul style="list-style-type: none"> - Long history of using spatial planning to develop the country - Administrative culture based on consensus and high expectation on the problem-solving capacities of the government. - Limited exchange of ideas in planning and related issues with Flanders - High relevance of written material for decision making - More open terms in policy - More presence of planners in the government - Decision-making of the planners aims to be more neutral 	<ul style="list-style-type: none"> - Limited use of spatial planning until the past couple of decades. - Administrative culture based compromise and less trust in the government, a "necessary evil" - Limited exchange of ideas in planning and related issues with the Netherlands - High relevance of agreements between stakeholders for decision making - Desire for precise terms in policy - More presence of consultants in the government - Decision-making is more influenced by political parties
SIMILARITIES	<ul style="list-style-type: none"> - Both share the same language and some historical roots. - The Netherlands has transitioned from regulative planning to a more decentralized planning, Flanders ambition is also to make this transition. This means that provinces are responsible for the development of their strategic plans. - In both the Netherlands and Flanders, international competition can dominate decision making and spatial planning at the cost of sustainability goals, like the port development. 	

UNBALANCED POWER

ZEELAND: RURAL, LOW DENSITY, SHRINKING, PERIPHERAL

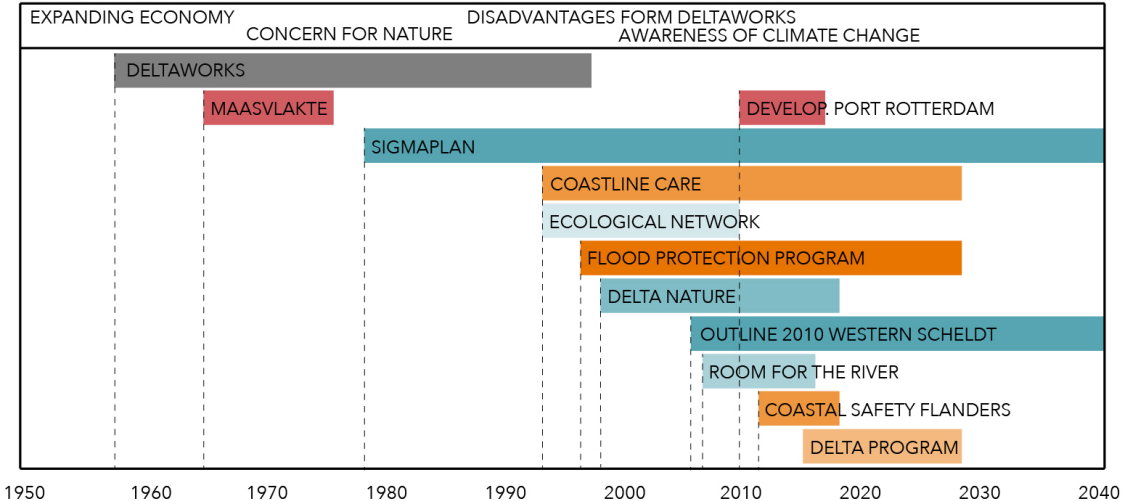
FLANDERS: MIXED USE, HIGH DENSITY, GROWING, CENTRAL

GOVERNANCE ASSESSMENT: SAFETY



SOCIAL
CONTEXT

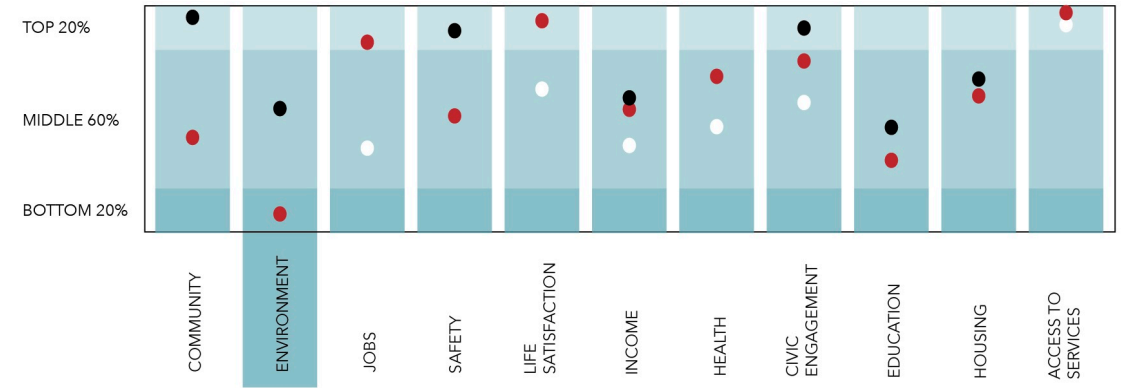
SAFETY
PROGRAM



FLOOD SAFETY PLANS

FROM HARD INFRASTRUCTURE TO
INTEGRATED SOLUTIONS WITH ECOLOGY

GOVERNANCE ASSESSMENT: ECOLOGY



- BEST PERFORMING PROVINCE
- ZEELAND PROVINCE
- WORST PERFORMING PROVINCE

Figure 46. Regional ranking for 11 well-being dimensions (Elaborated by author. Source: OECD Regional Well-Being Database, 2017)

PROTECTION FOR NATURE - NATURA 2000

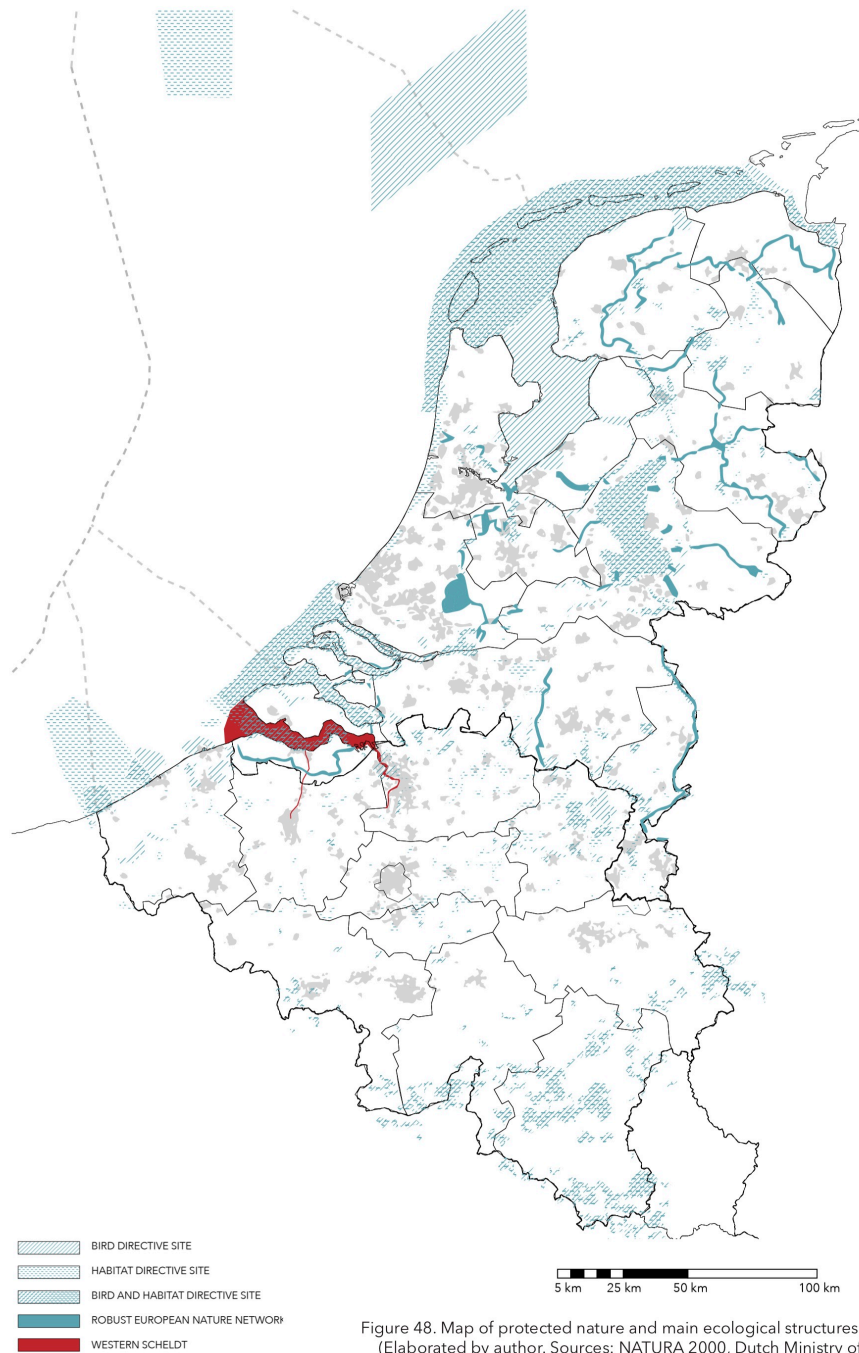
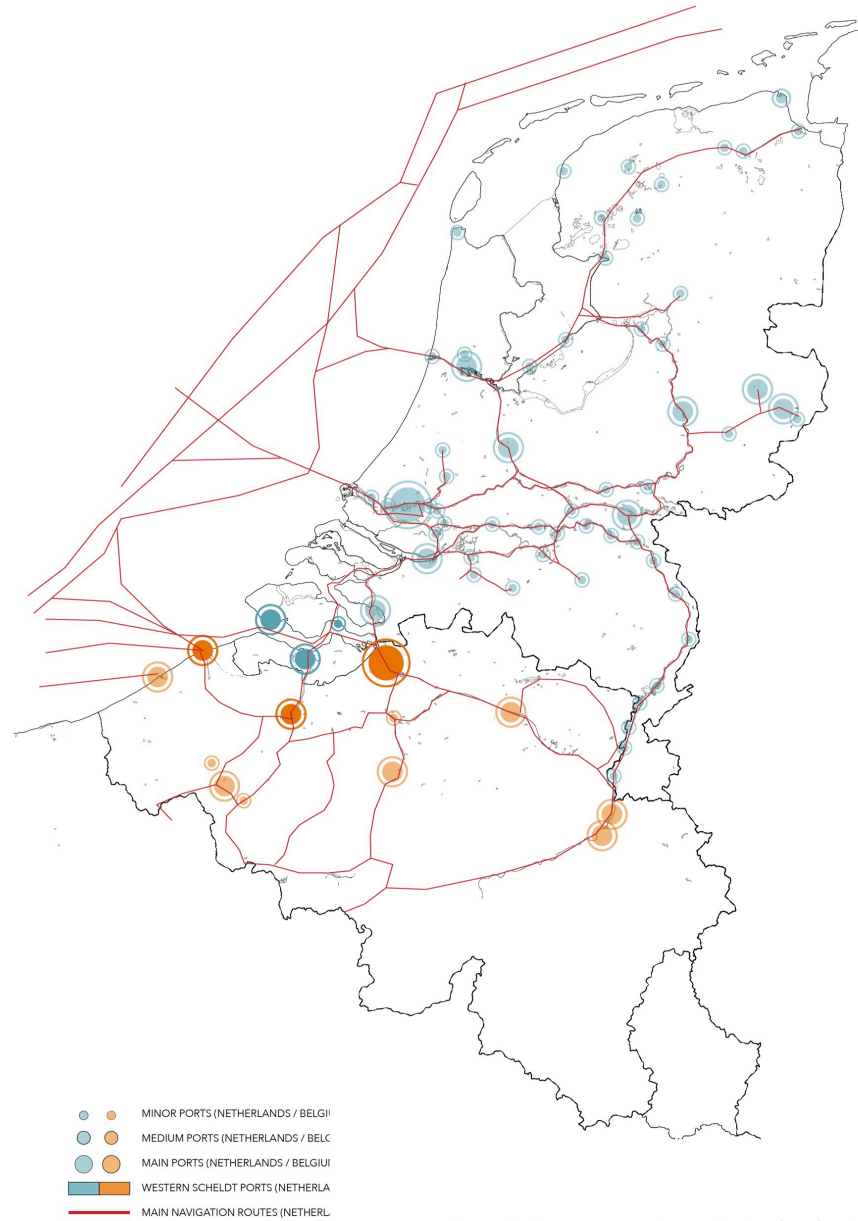


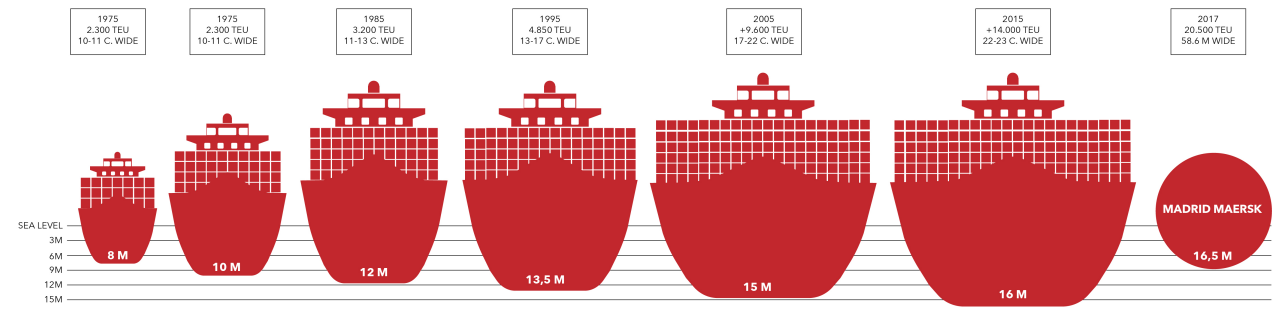
Figure 48. Map of protected nature and main ecological structures. (Elaborated by author. Sources: NATURA 2000, Dutch Ministry of Agriculture, Nature and Food quality)

GOVERNANCE ASSESSMENT: ACCESSIBILITY



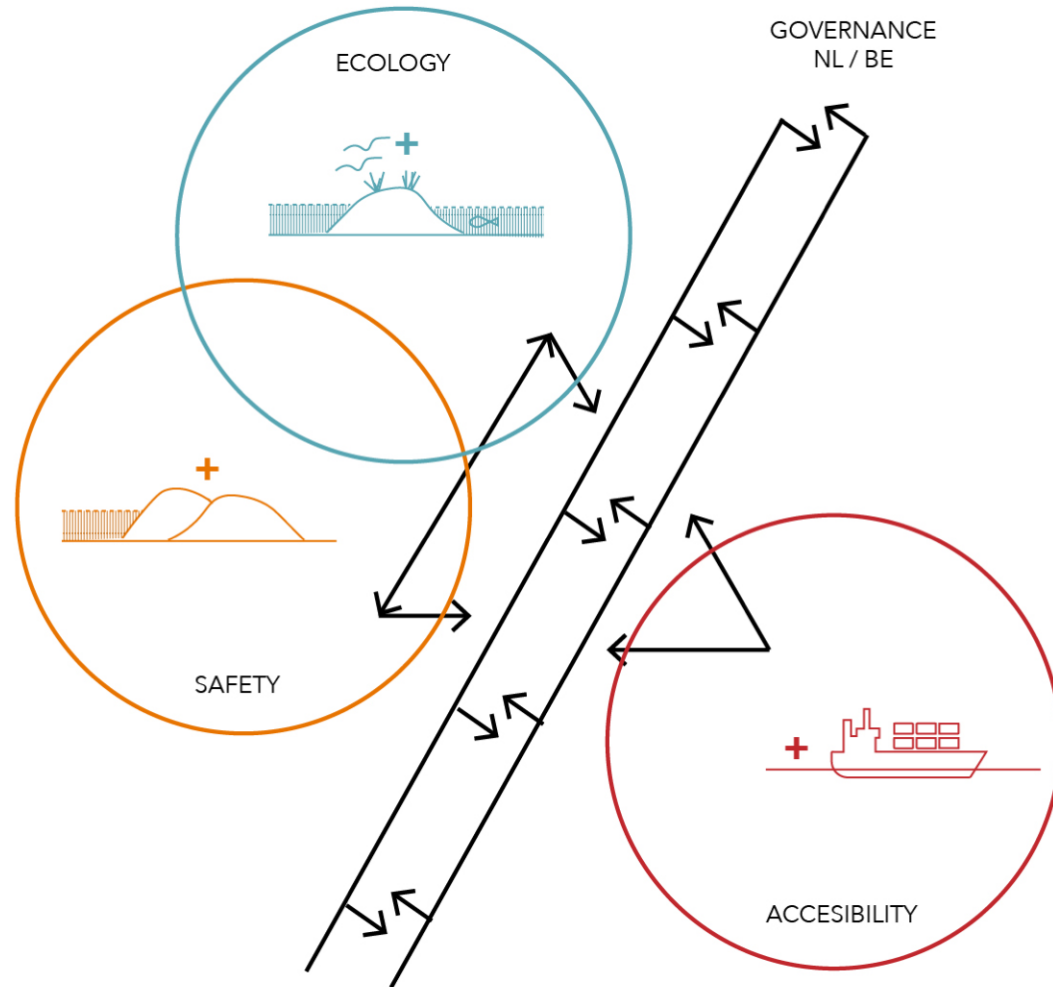
- MINOR PORTS (NETHERLANDS / BELGIUM)
- MEDIUM PORTS (NETHERLANDS / BELGIUM)
- MAIN PORTS (NETHERLANDS / BELGIUM)
- WESTERN SCHELDT PORTS (NETHERLANDS)
- MAIN NAVIGATION ROUTES (NETHERLANDS)

Figure 51. European water transport network and ports
(Elaborated by author. Sources Rijksoverheid)



ENLARGEMENTS ON NAVIGATION CHANNELS FOR LARGER SHIPS

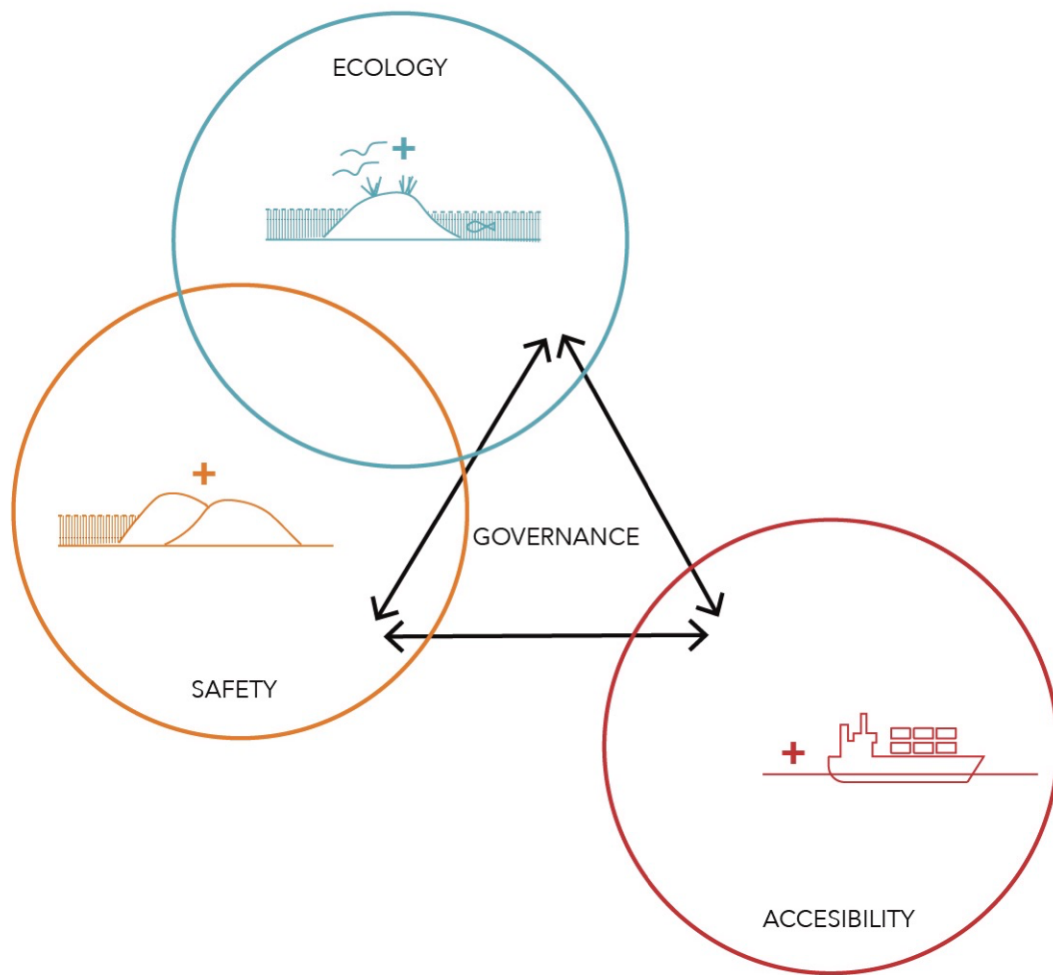
GOVERNANCE ASSESSMENT: CONCLUSION



FLOOD PROTECTION AND NATURE ARE
WELL INTEGRATED

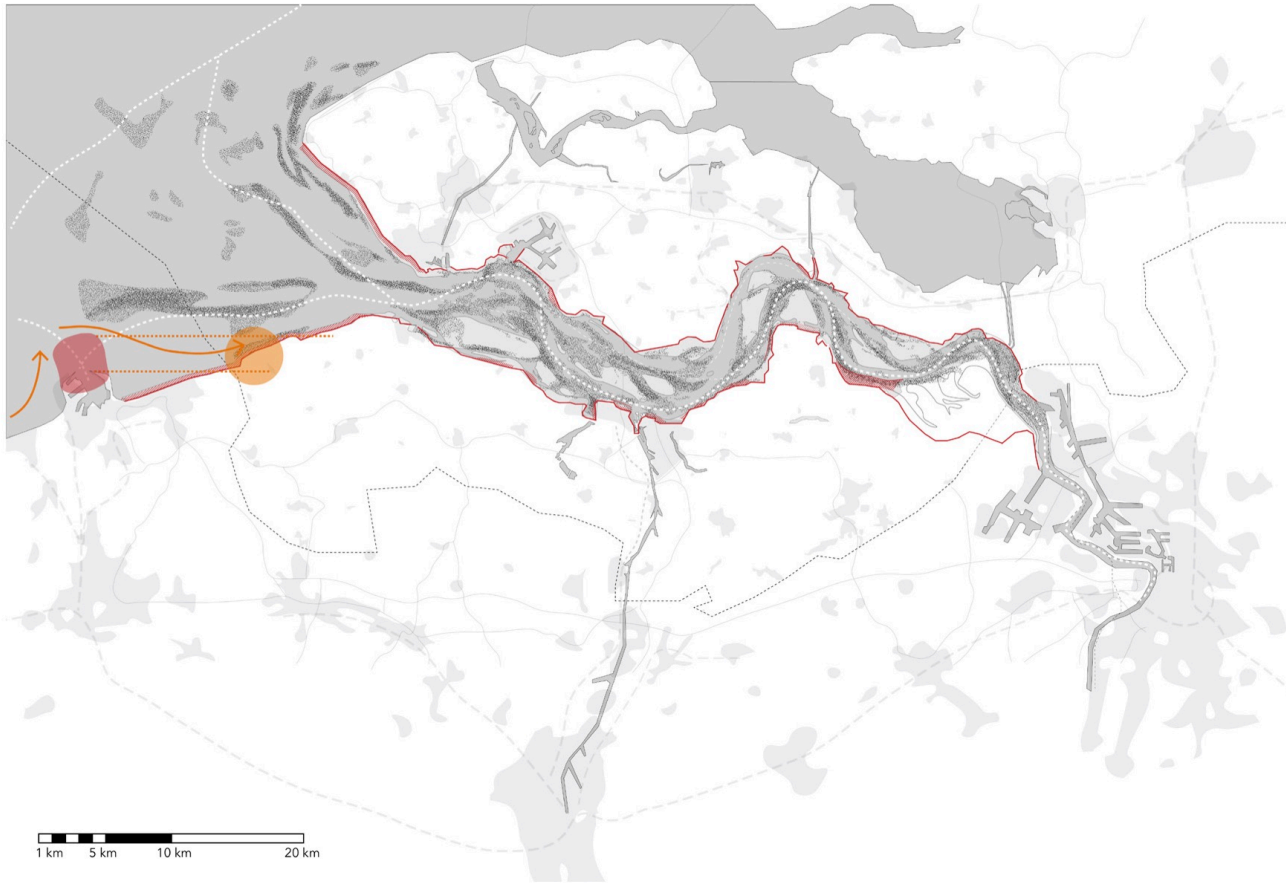
PORTS INFLUENCE DEVELOPMENT, BUT
MOSTLY AUTONOMOUSLY

APPROACH



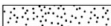






INTEGRATE PORT DEVELOPMENT WITH
LOCAL IMPACTS ON ECOLOGY AND SAFETY
PORTS AS DRIVERS FOR EBA STRATEGIES

APPROACH: KEY PROJECTS

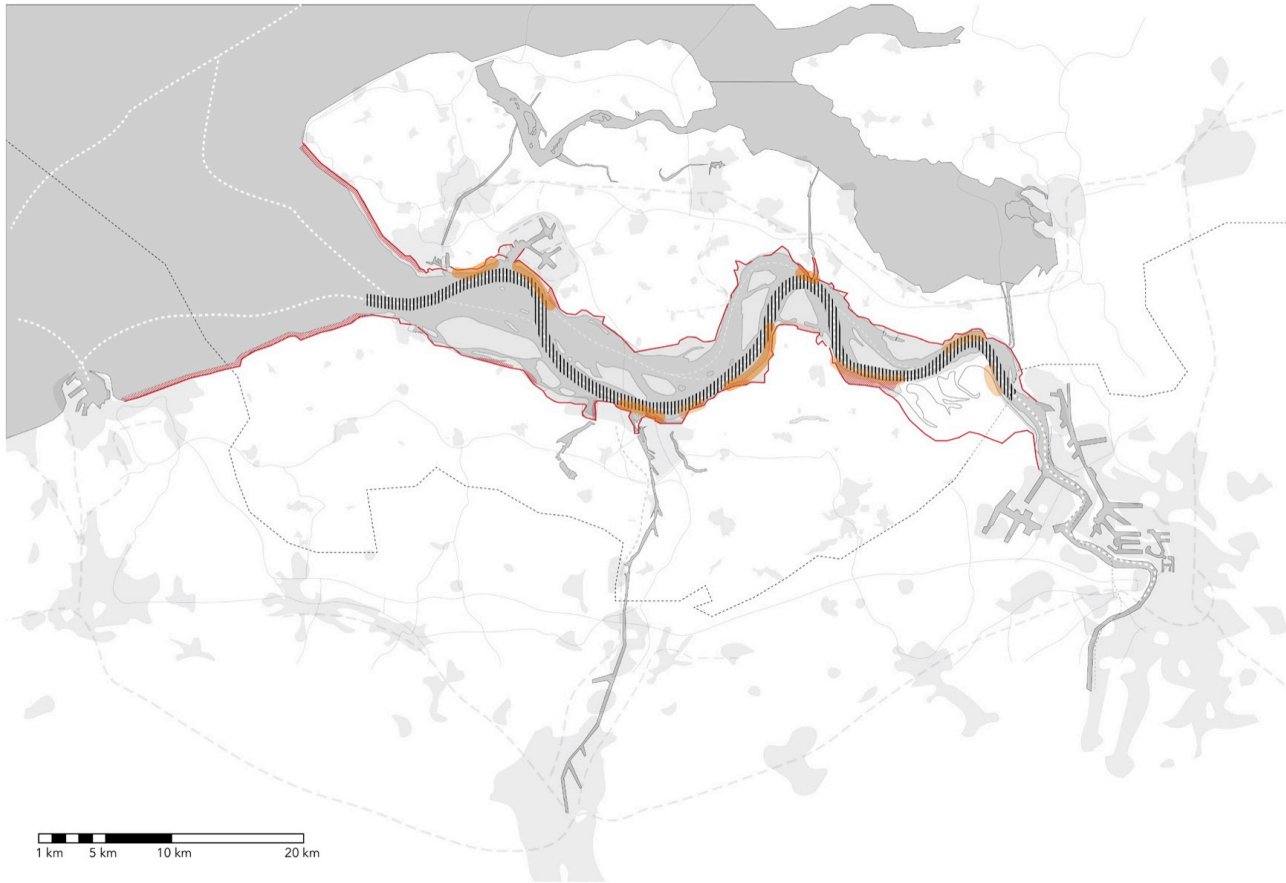


ZONE 1: RIVER MOUTH

EXPANSION PORT OF ZEEBRUGGE AND
COASTAL EROSION






-  ERODING AREAS
-  BANK PROTECTION
-  DIKES
-  AREA OF PORT EXPANSION
-  ALTERED CURRENTS
-  DISPLACEMENT OF ERODING AREA
-  HIGH RISK AREA

APPROACH: KEY PROJECTS

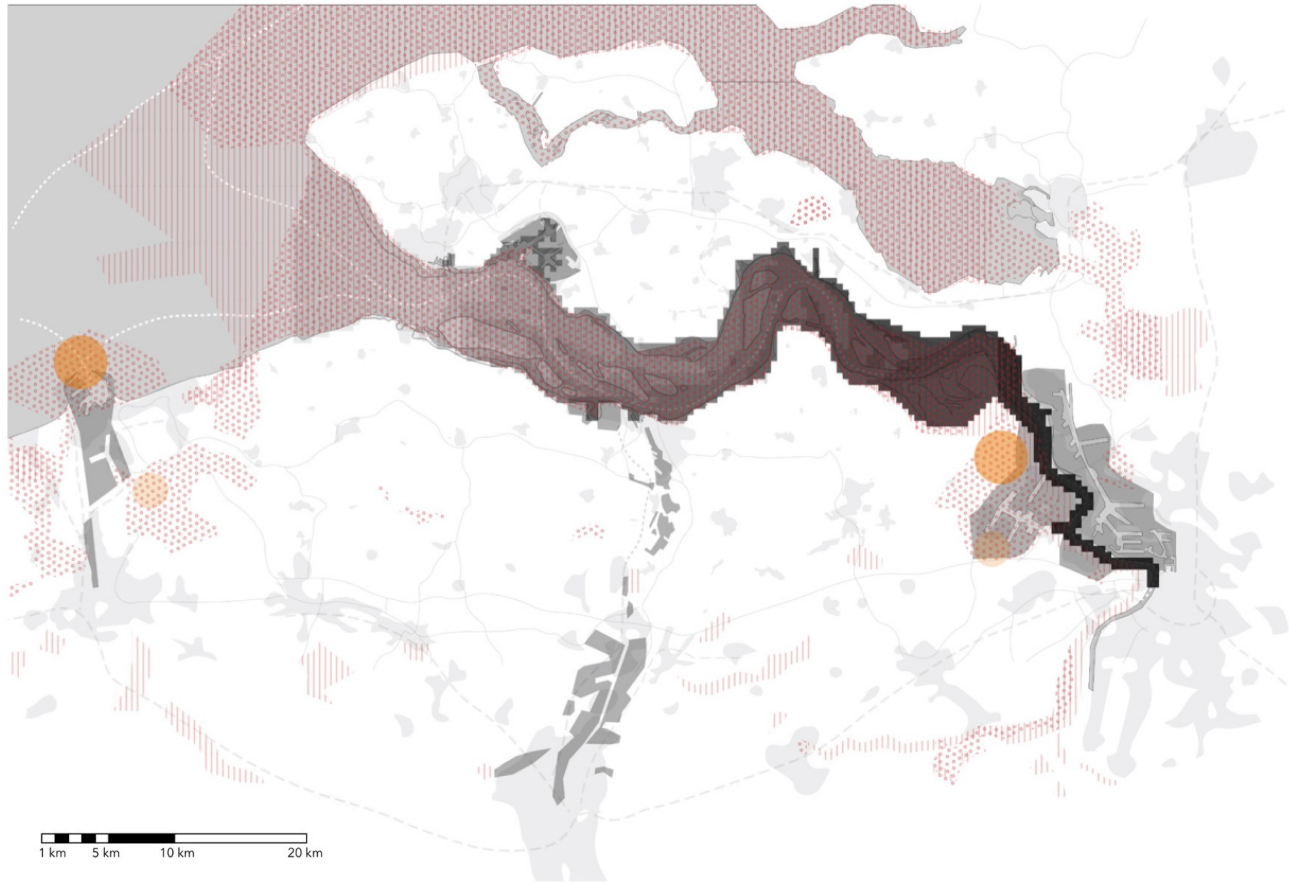


ZONE 2: MID - STREAM







HIGH MAINTENANCE DREDGING AND BANK
STABILITY

-  NAVIGATION CHANNEL
-  BANK PROTECTION
-  DIKES
-  MODERATE RISK AREA
-  HIGH RISK AREA

APPROACH: KEY PROJECTS

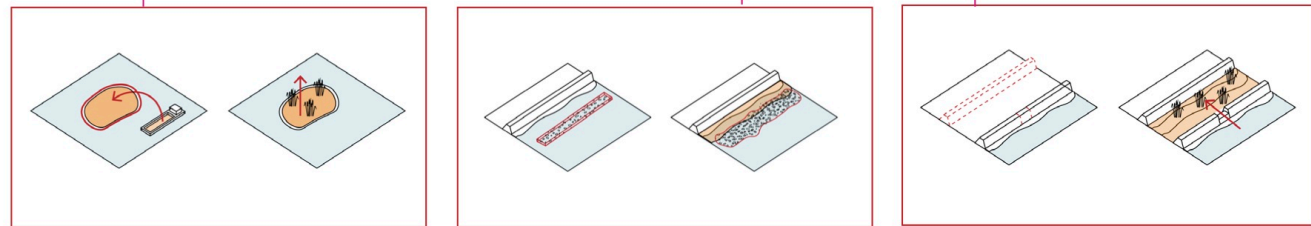
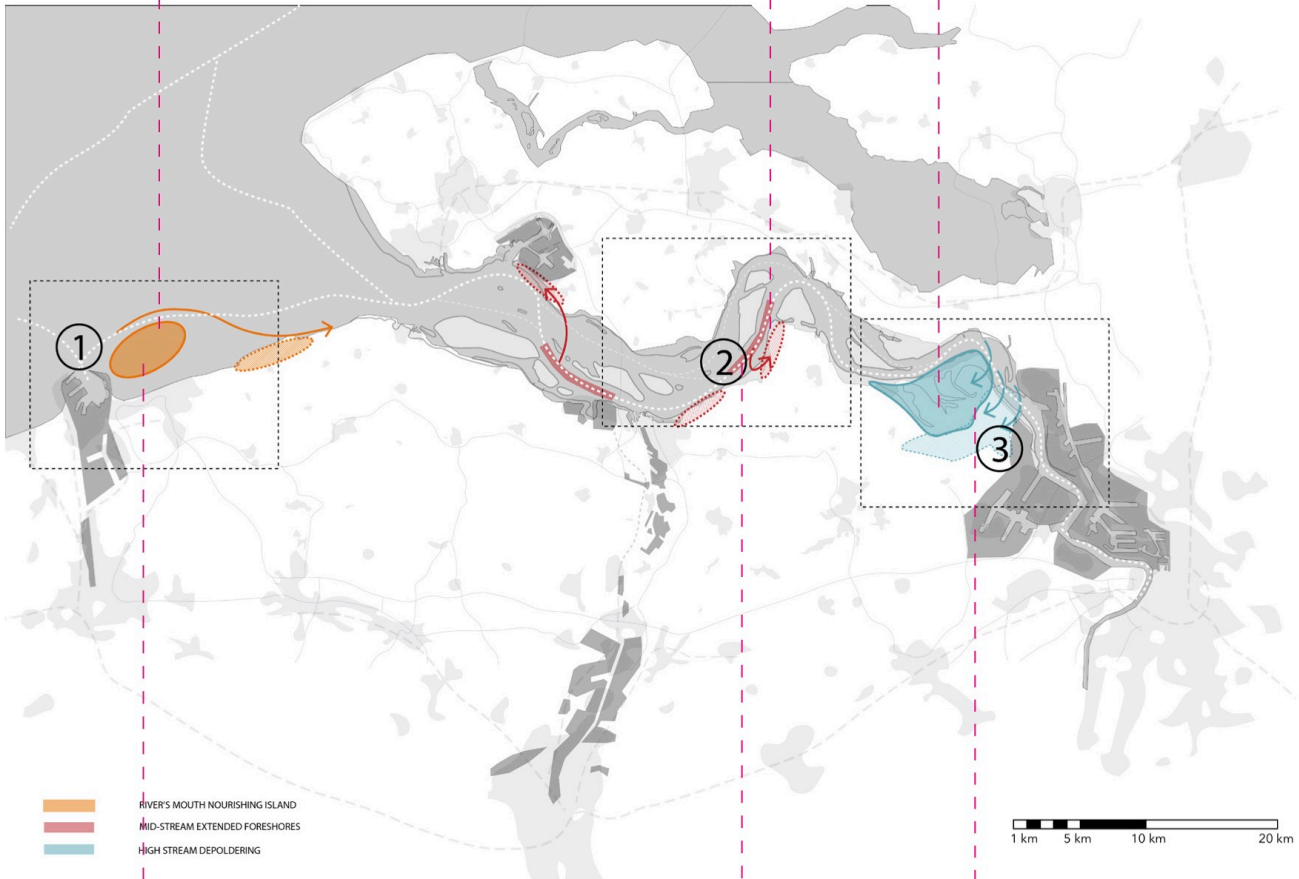
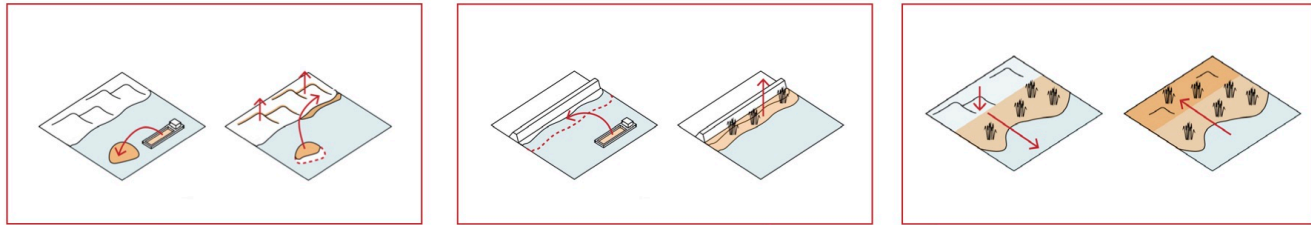


1 km 5 km 10 km 20 km

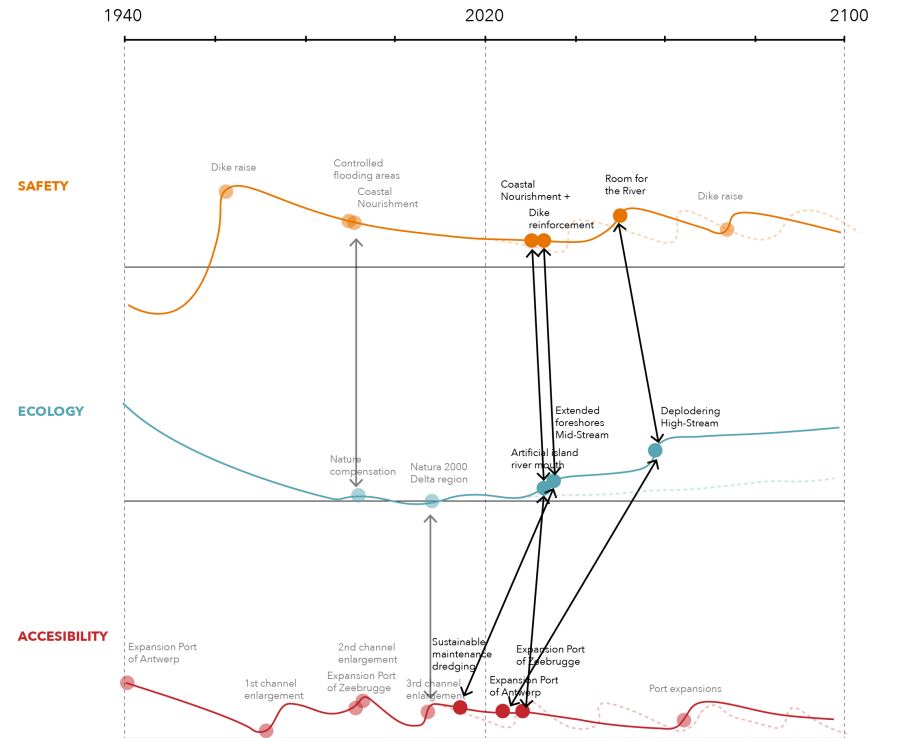
-  NATURA 200 BIRD PROTECTED SITE
-  NATURA 200 HABITAT PROTECTED SITE
-  WATER QUALITY
-  PORT AREAS
-  PORT FUTURE EXPANSION CONFLICT AREAS
-  PORT POSSIBLE EXPANSION CONFLICT AREAS

ZONE 3: HIGH - STREAM

EXPANSION PORT OF ANTWERP AND
ALTERATION OF PROTECTED SITES



APPROACH: BWN PROJECTS



COMBINING ENGINEERING AND NATURAL PROCESSES TO BENEFIT THE 3 PRIORITY FUNCTIONS

APPROACH: SCENARIO PLANNING

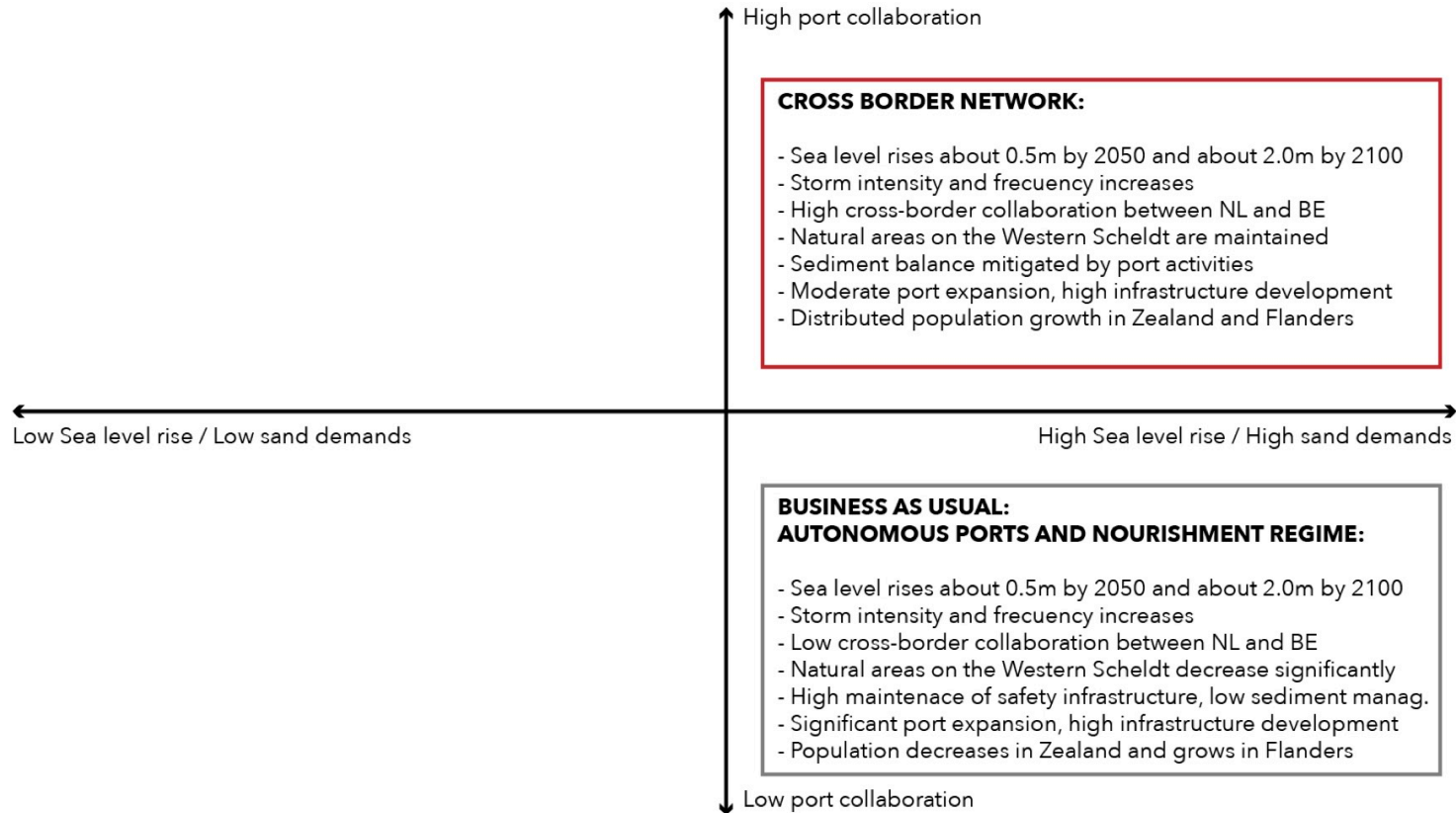
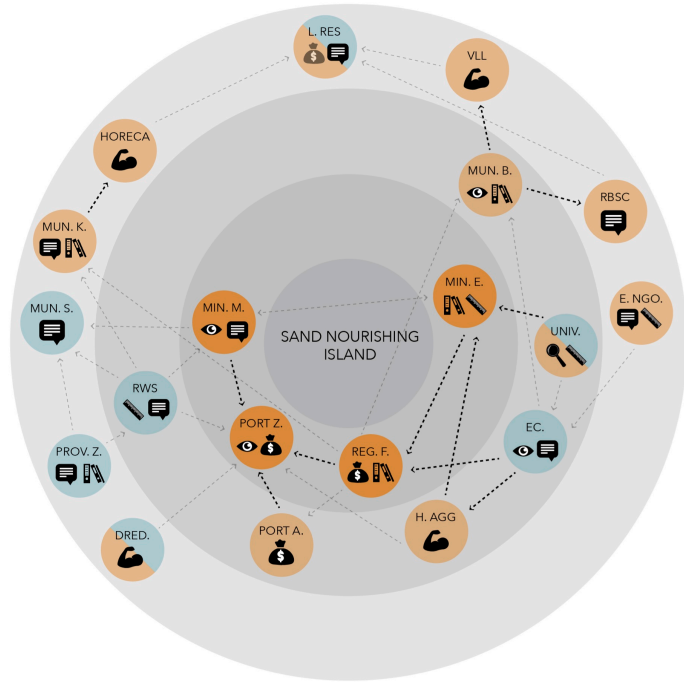


Figure 61. Scenarios
(Elaborated by author.)

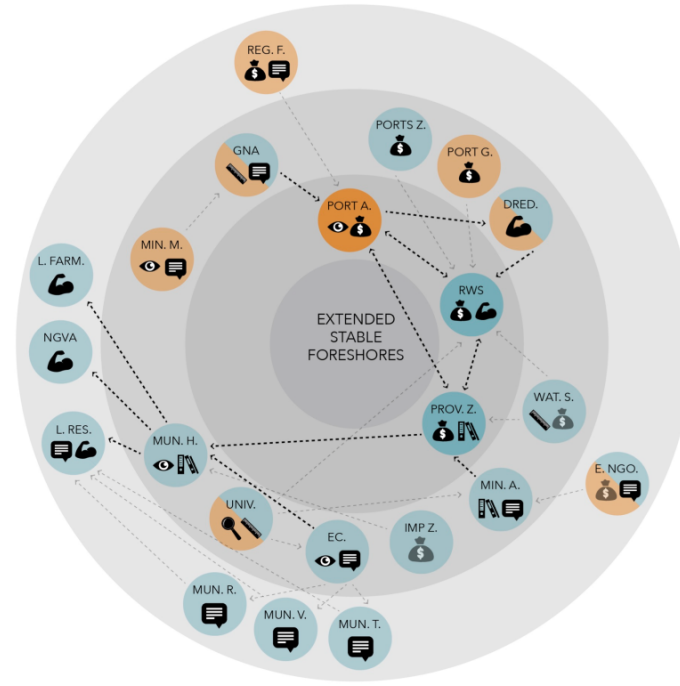
GOVERNANCE PROPOSAL



- PORT Z. Port of Zeebrugge
- REG. F. Regional Government Flanders
- MIN. M. Ministry Mobility, Public Works, ...
- MIN. E. Ministry For ... Environment And Nature
- RWS Rijswaterstaat Zee and Delta
- PORT A. Port Antwerp
- H. AGG. Hanson Aggregates
- EC. Ecoshape
- UNIV. Universities
- MUN. B. Municipality Brugges
- MUN. K. Municipality Knokke-Heist
- MUN. S. Municipality Sluis
- PROV. Z. Province Of Zeeland
- DRED. Dredging Companies
- E. NGO. Environmental Ngo's
- RBSC. Sailing Club Zeebrugge
- VLL. Flemish Fishaucton - Aquaculture
- L. RES. Local Residents
- HORECA. Hotels, Restaurants, Catering

- 👤 Labor force
- 💰 Economic support
- 📋 Regulation (Policies)
- 👁️ Supervision
- 🗣️ Consultation
- 🔍 Monitoring
- 🔑 Research

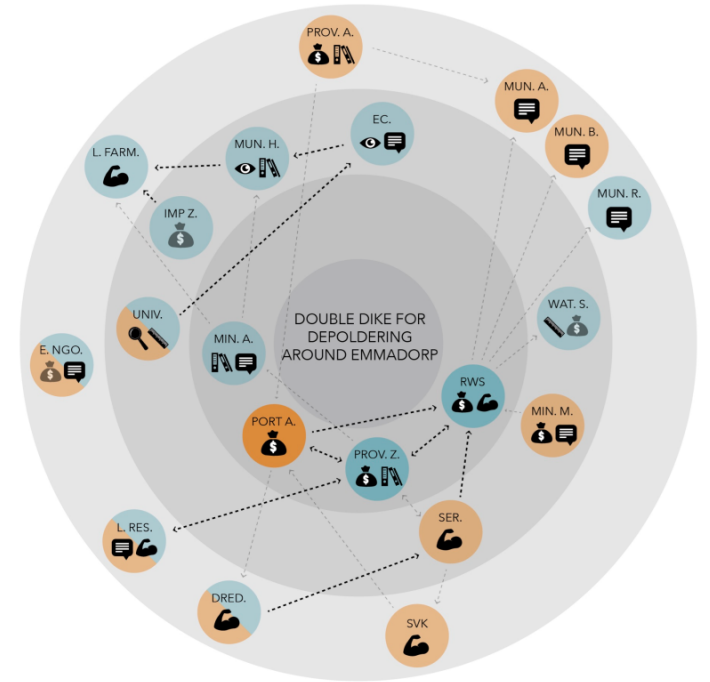
Figure 78: Onion diagram for governance proposal Zone 1 (Elaborated by author)



- PORT A. Port of Antwerp
- PROV. Z. Province of Zeeland
- RWS Rijswaterstaat Zee and Delta
- MIN. A. Ministry of Agriculture, Nature and Food Q.
- WAT. S. Waterboard Scheldestromen
- DRED. Dredging Companies
- PORT G. Port of Ghent
- PORTS Z. Ports of Zeeland
- GNA Common Nautic Authority Western Scheldt
- MIN. M. Ministry Mobility, Public Works, ...
- MUN. H. Municipality Hulst
- UNIV. Universities
- EC. Ecoshape
- IMP. Z. Impuls Zeeland
- E. NGO. Environmental Ngo's
- REG. F. Regional Government Flanders
- L. FARM. Local Farmers
- NGVA Dutch Association for Aquaculture
- L. RES. Local Residents
- MUN. R. Municipality Reimerswaal
- MUN. V. Municipality Vlissingen
- MUN. T. Municipality Terneuzen

- 👤 Labor force
- 💰 Economic support
- 📋 Regulation (Policies)
- 👁️ Supervision
- 🗣️ Consultation
- 🔍 Monitoring
- 🔑 Research

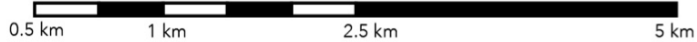
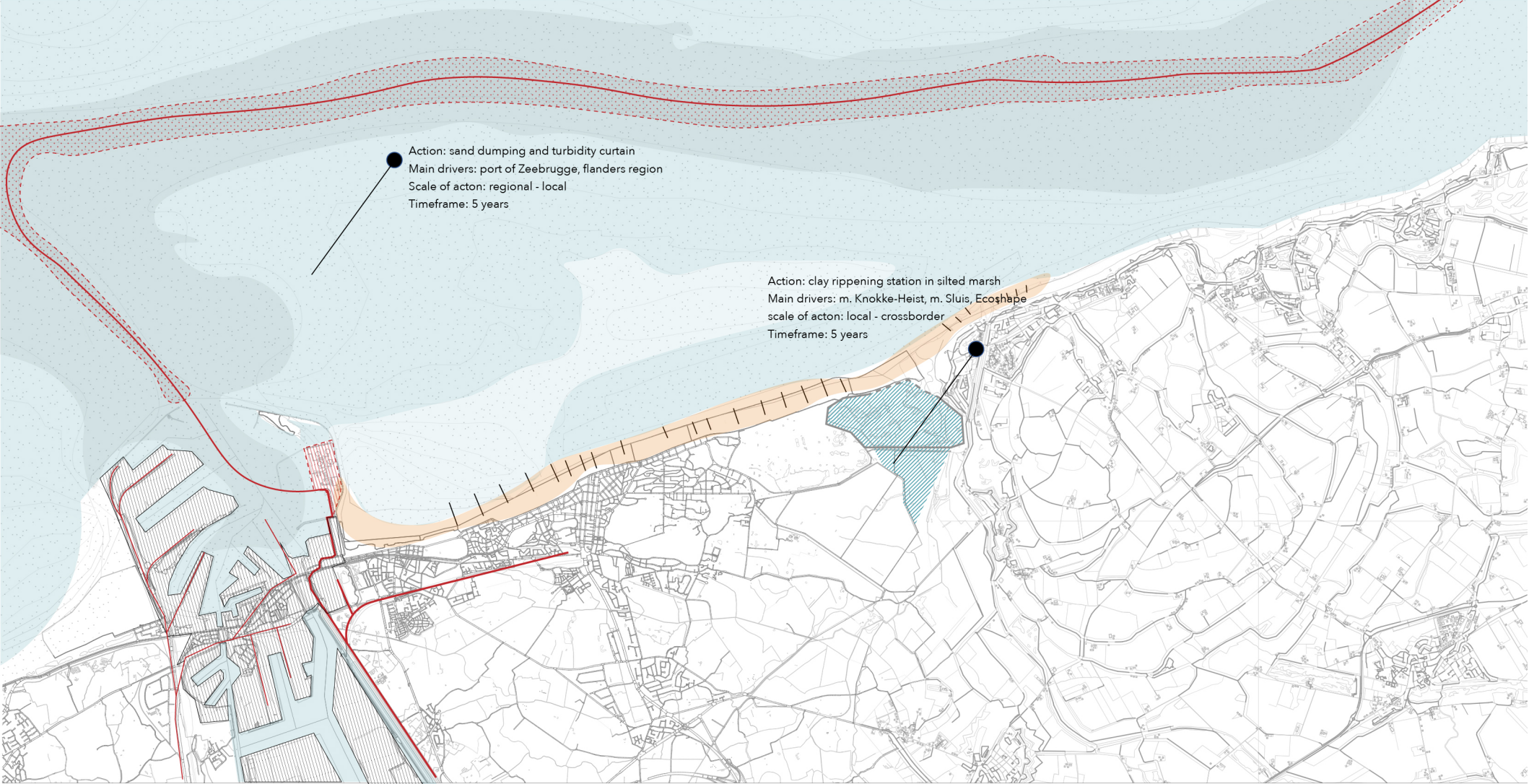
Figure 82: Onion diagram for governance proposal Zone 2 (Elaborated by author)

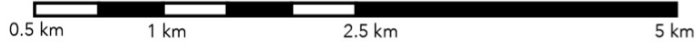
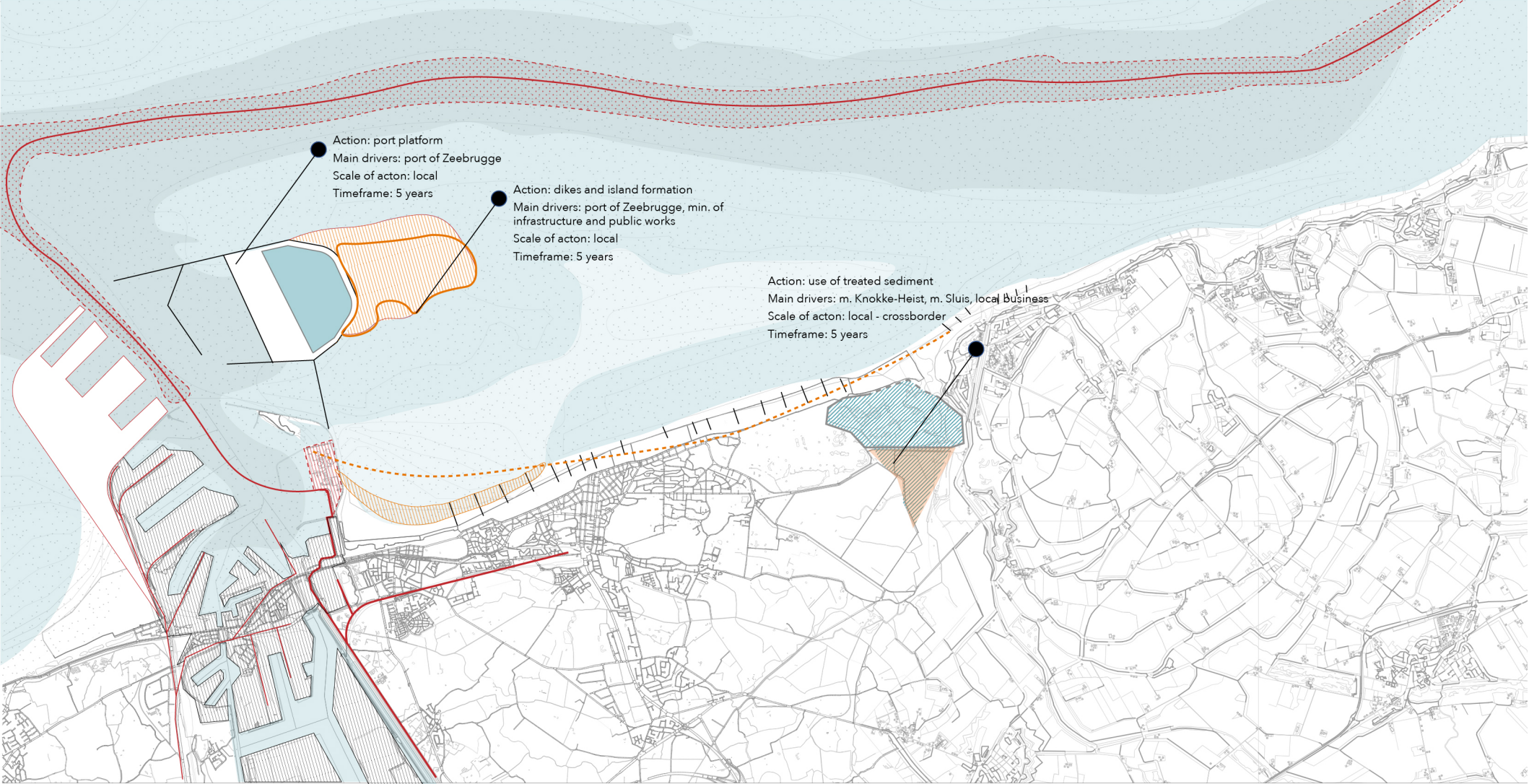


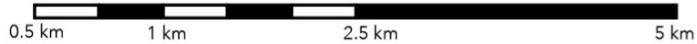
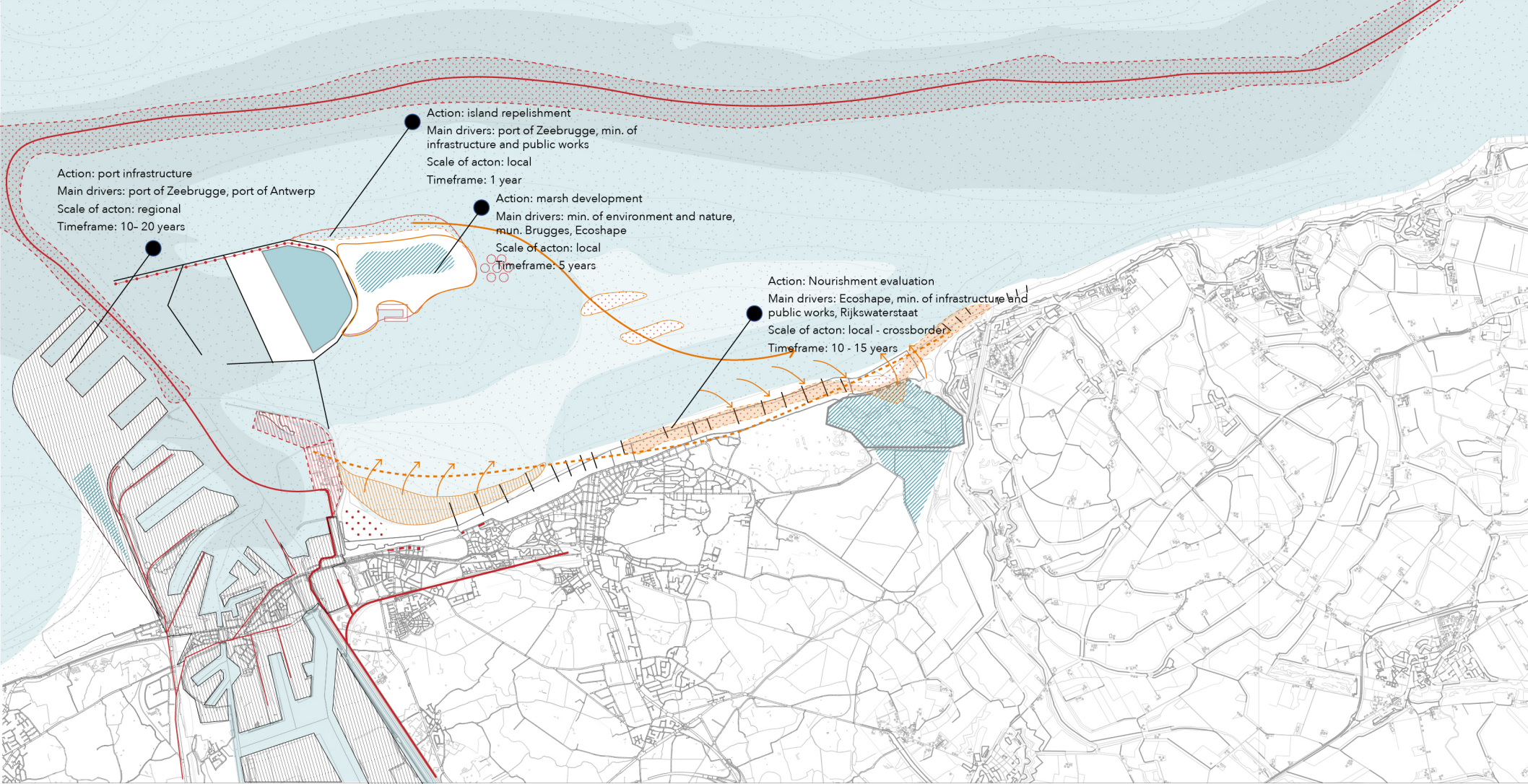
- PORT A. Port of Antwerp
- PROV. Z. Province Of Zeeland
- RWS Rijswaterstaat Zee and Delta
- MIN. A. Ministry of Agriculture, Nature and Food Q.
- WAT. S. Waterboard Scheldestromen
- SEREANT. SEREANT
- MIN. M. Ministry Mobility, Public Works, ...
- UNIV. Universities
- EC. Ecoshape
- MUN. H. Municipality Hulst
- IMP. Z. Impuls Zeeland
- L. FARM. Local Farmers
- L. RES. Local Residents
- DRED. Dredging Companies
- E. NGO. Environmental Ngo's
- SVK. SVK (Materials company)
- PROV. A. Province of Antwerp
- MUN. A. Municipality Antwerp
- MUN. B. Municipality Beveren
- MUN. R. Municipality Reimerswaal

- 👤 Labor force
- 💰 Economic support
- 📋 Regulation (Policies)
- 👁️ Supervision
- 🗣️ Consultation
- 🔍 Monitoring
- 🔑 Research

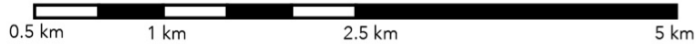
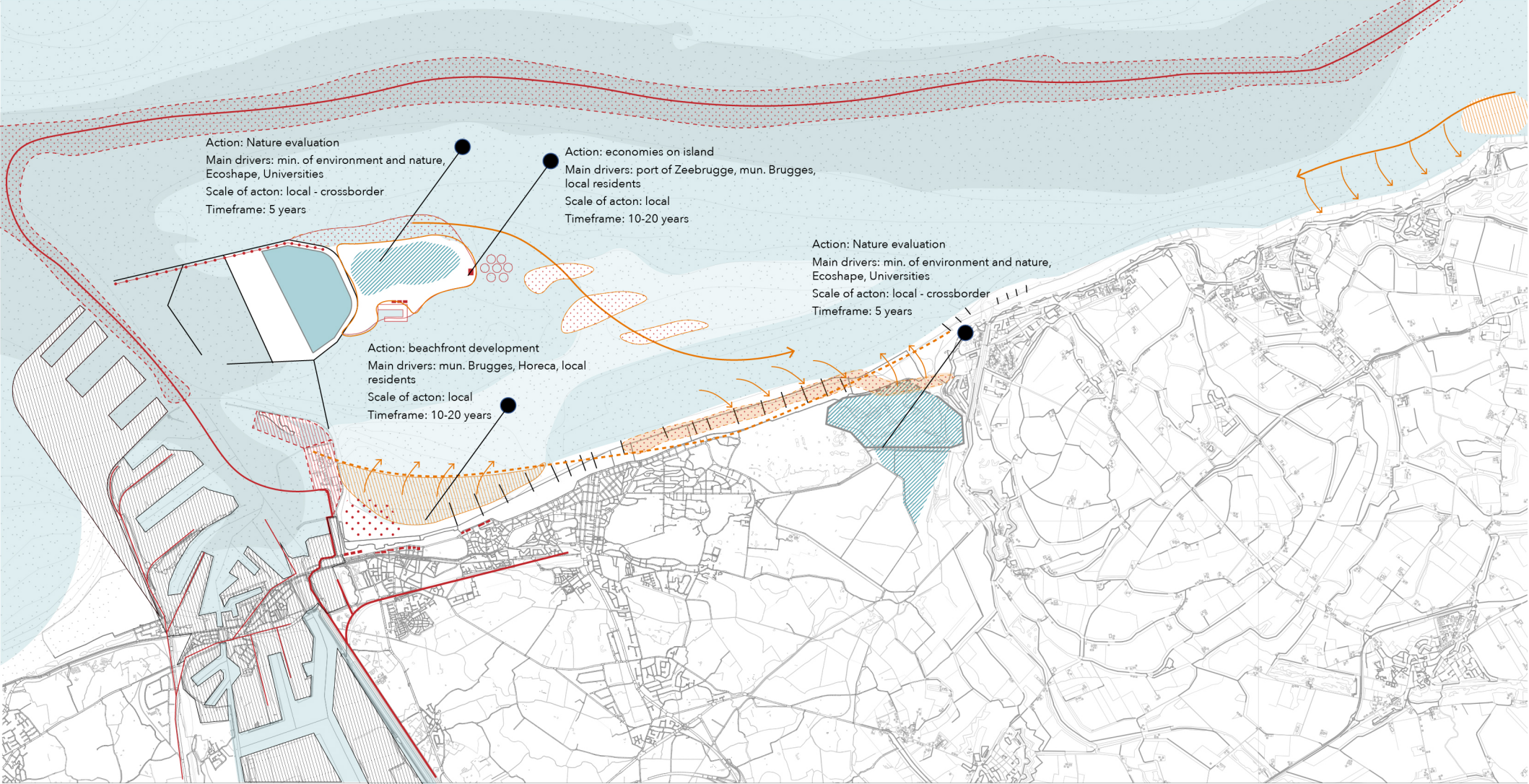
Figure 86: Onion diagram for governance proposal Zone 3 (Elaborated by author)



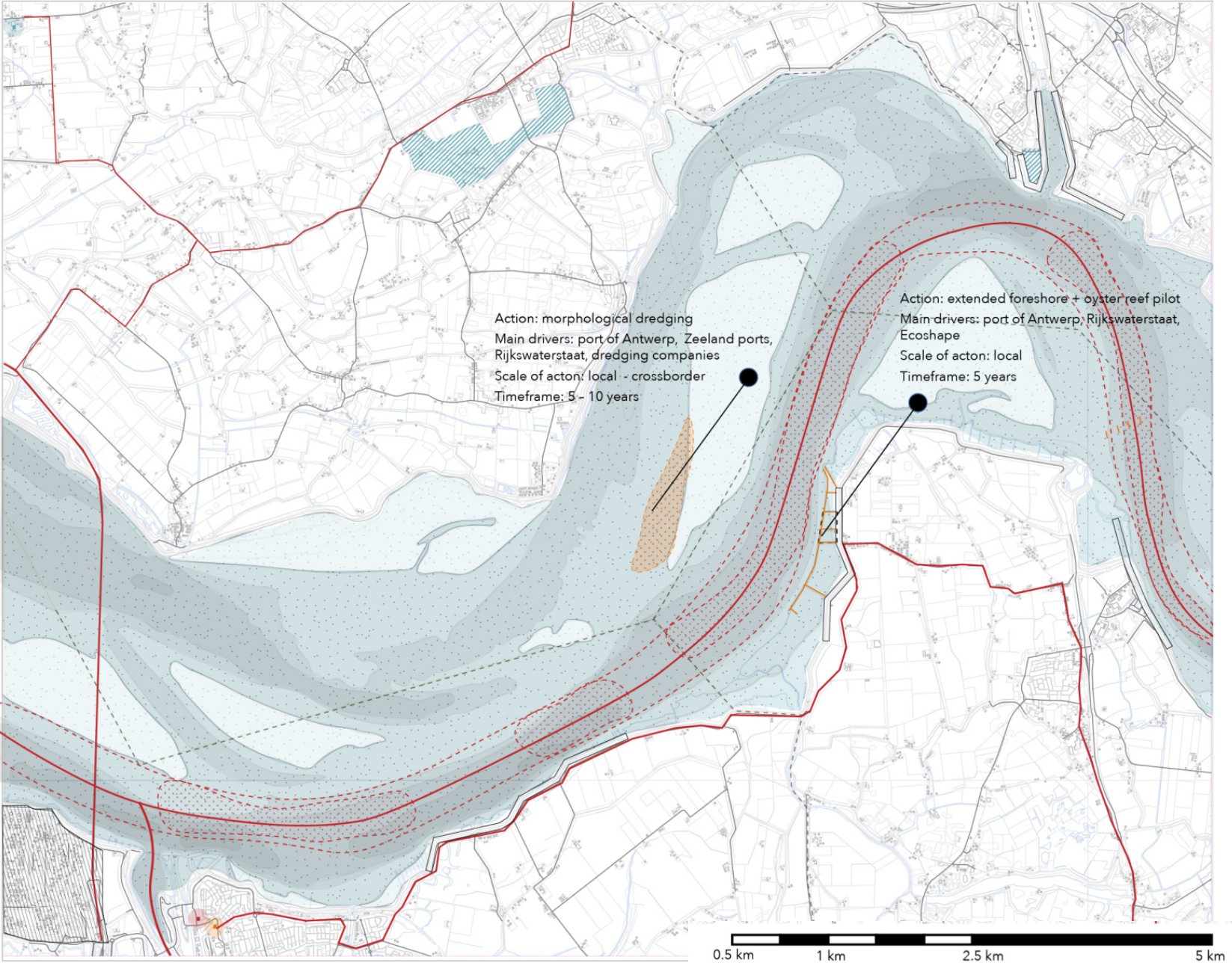




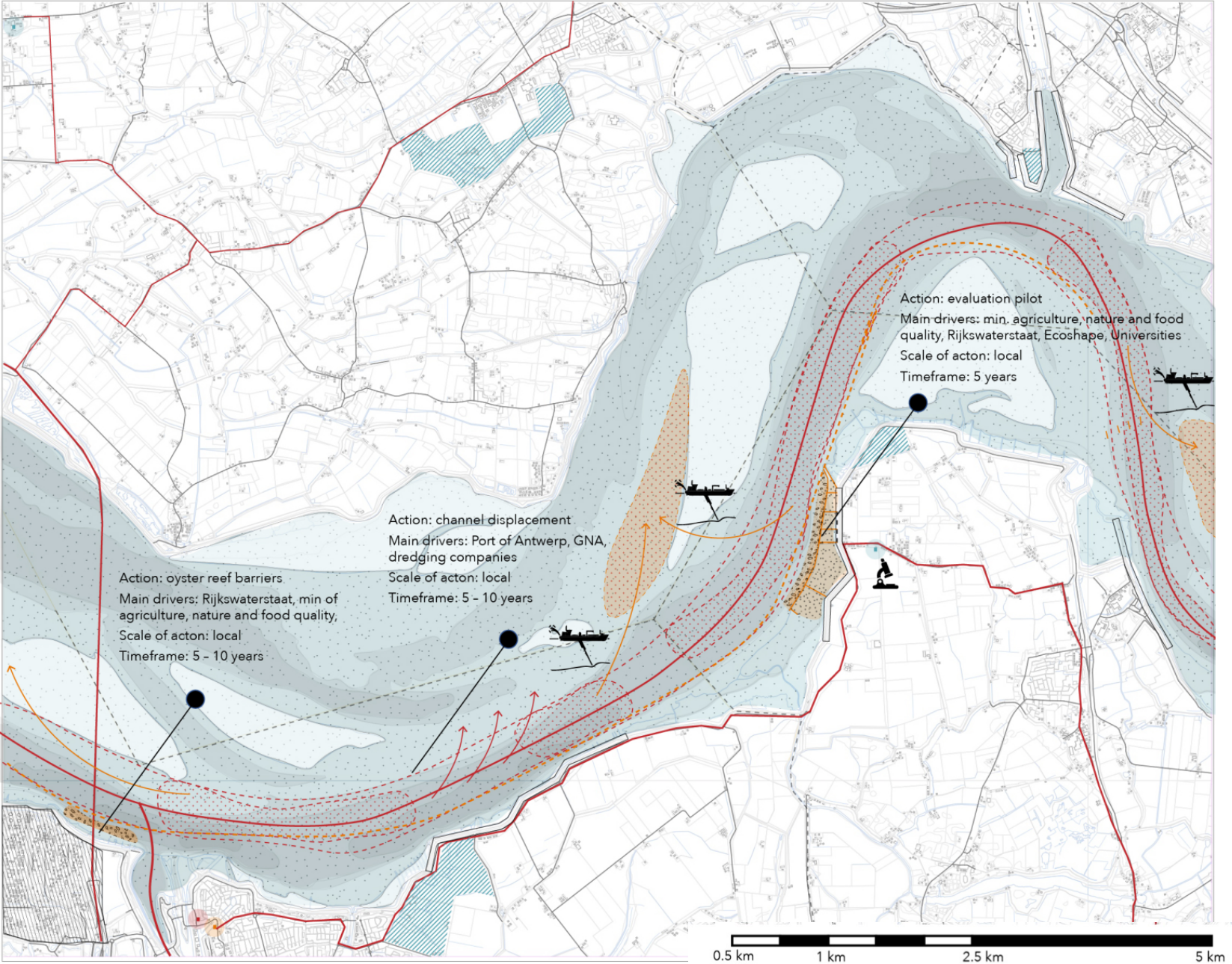
DESIGN PROPOSAL: ZONE 1



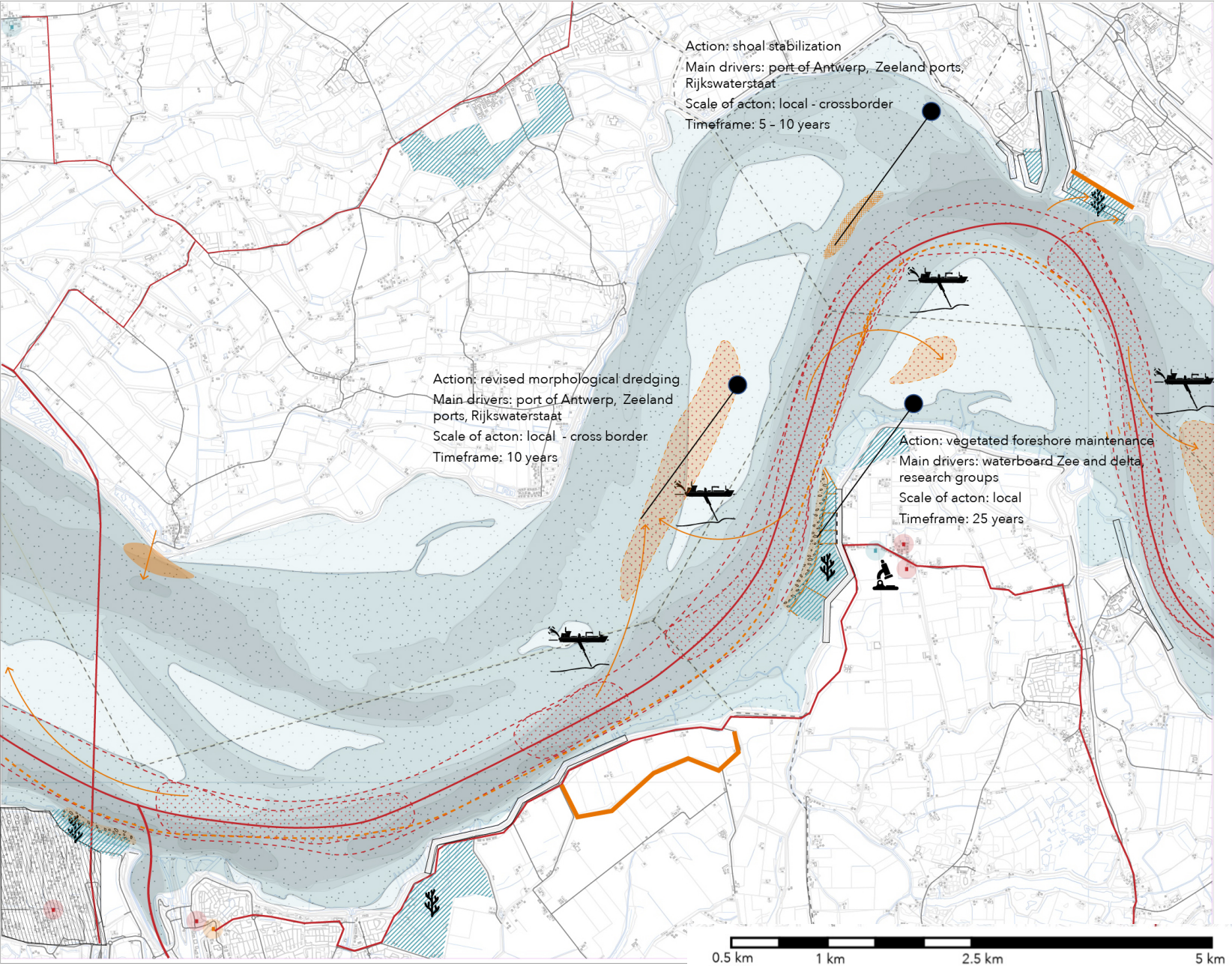
DESIGN PROPOSAL: ZONE 2



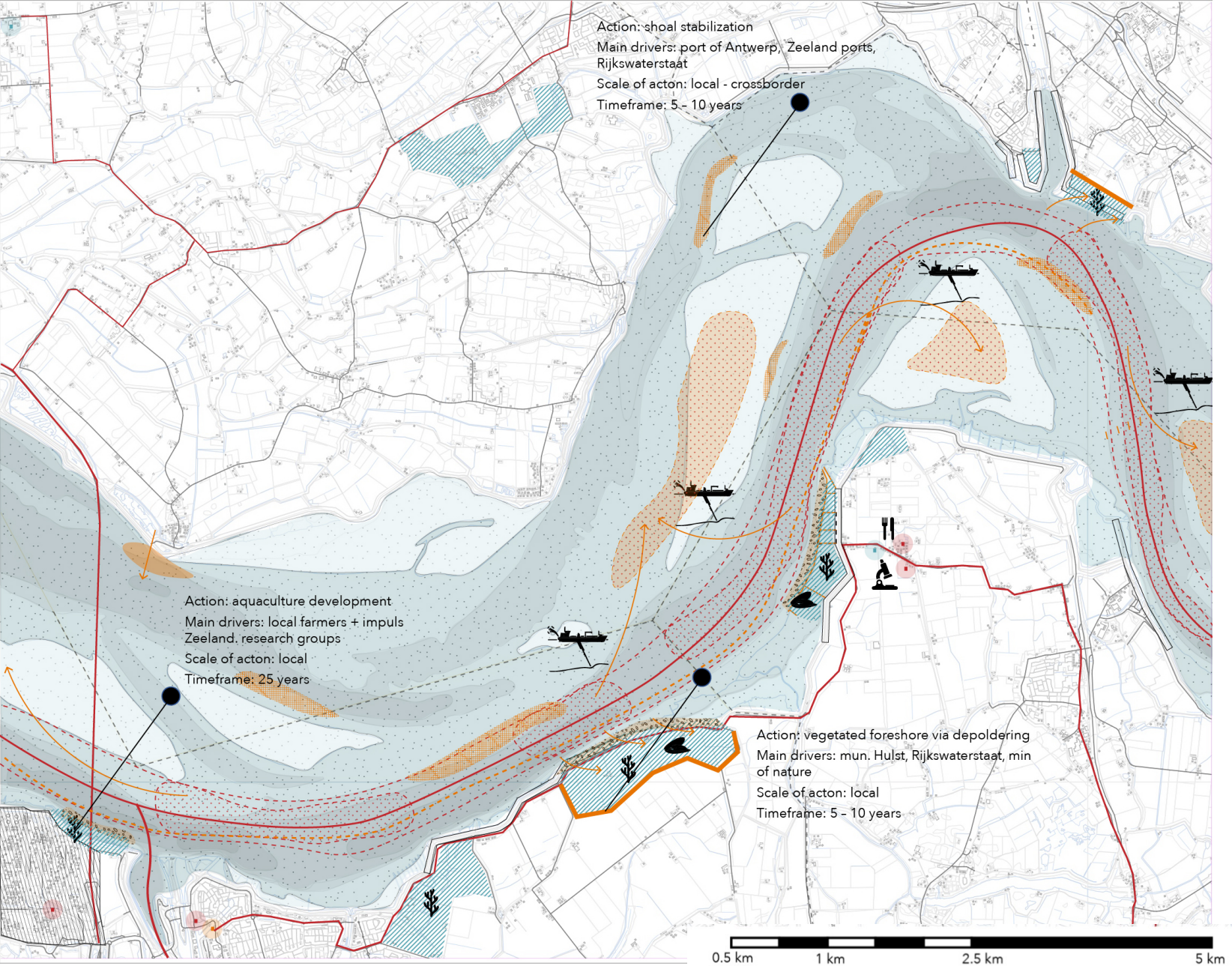
DESIGN PROPOSAL: ZONE 2



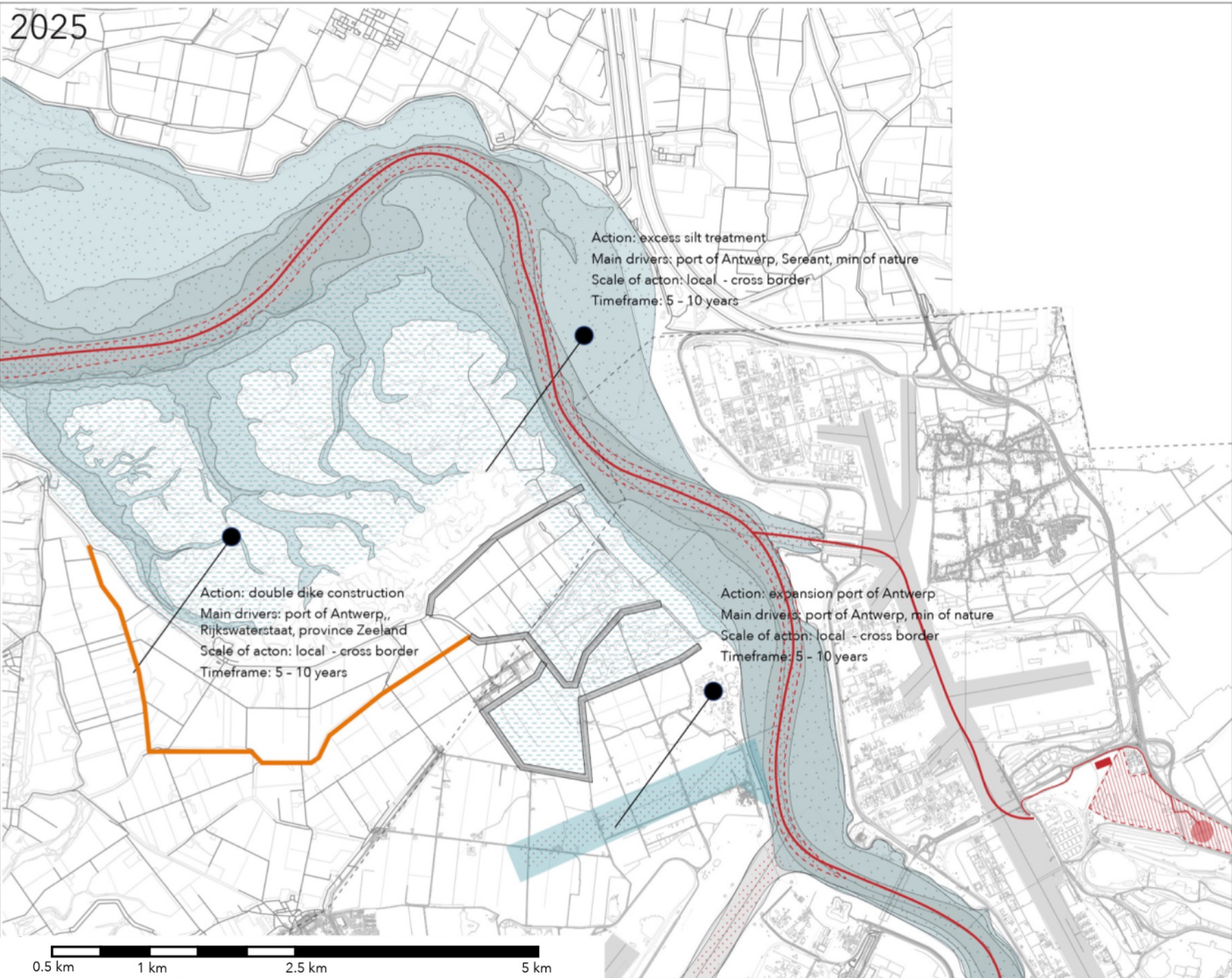
DESIGN PROPOSAL: ZONE 2



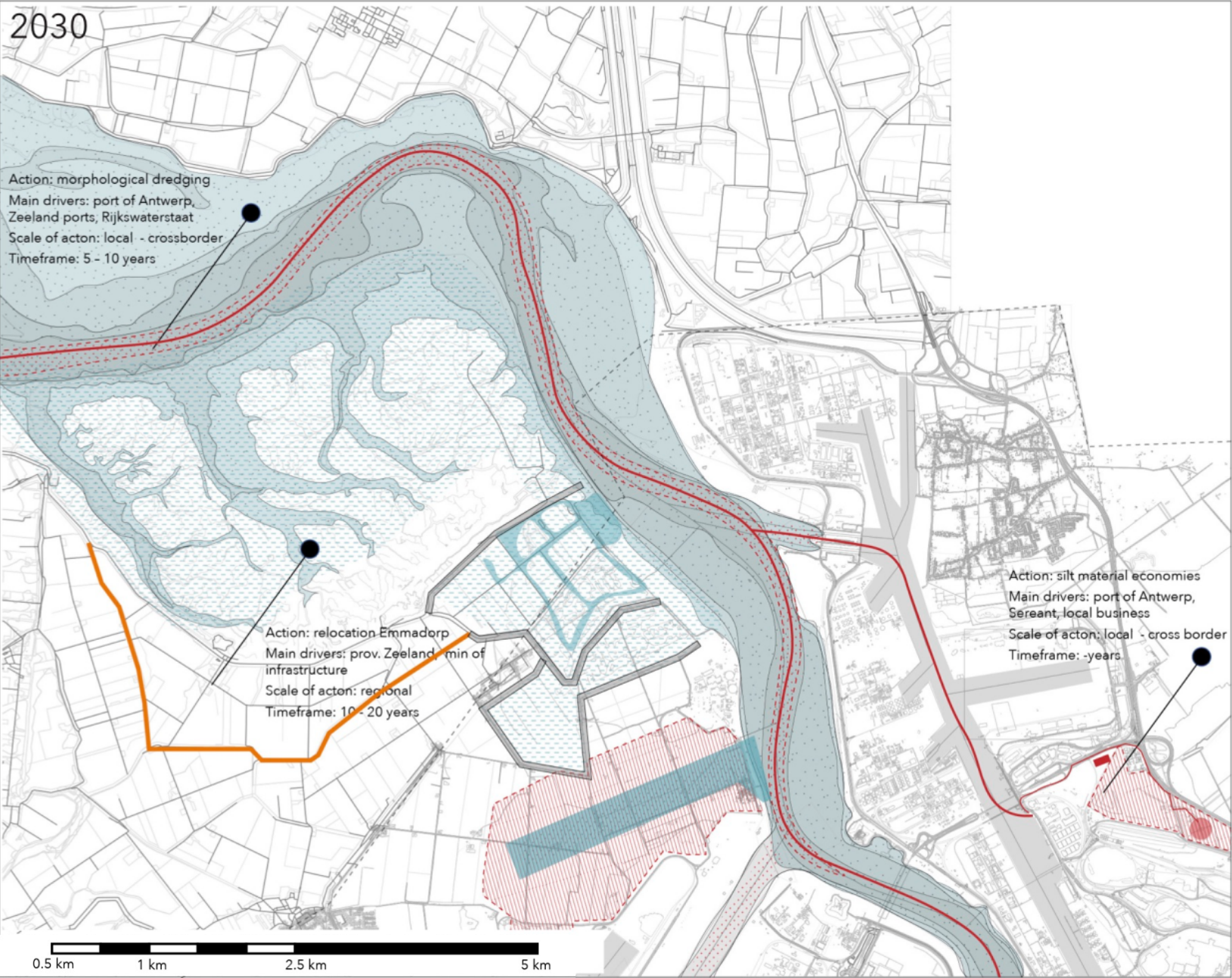
DESIGN PROPOSAL: ZONE 2



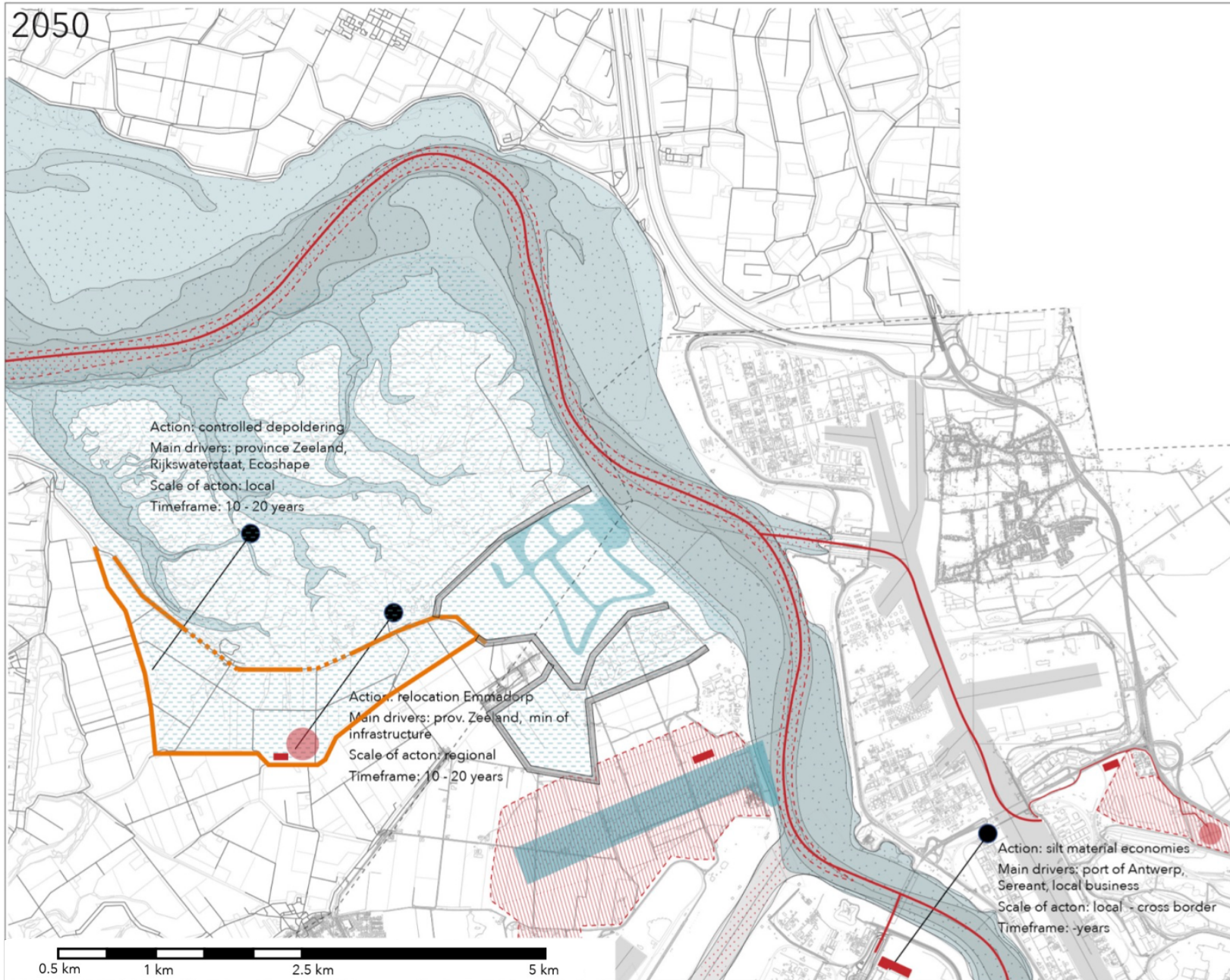
2025



DESIGN PROPOSAL: ZONE 3



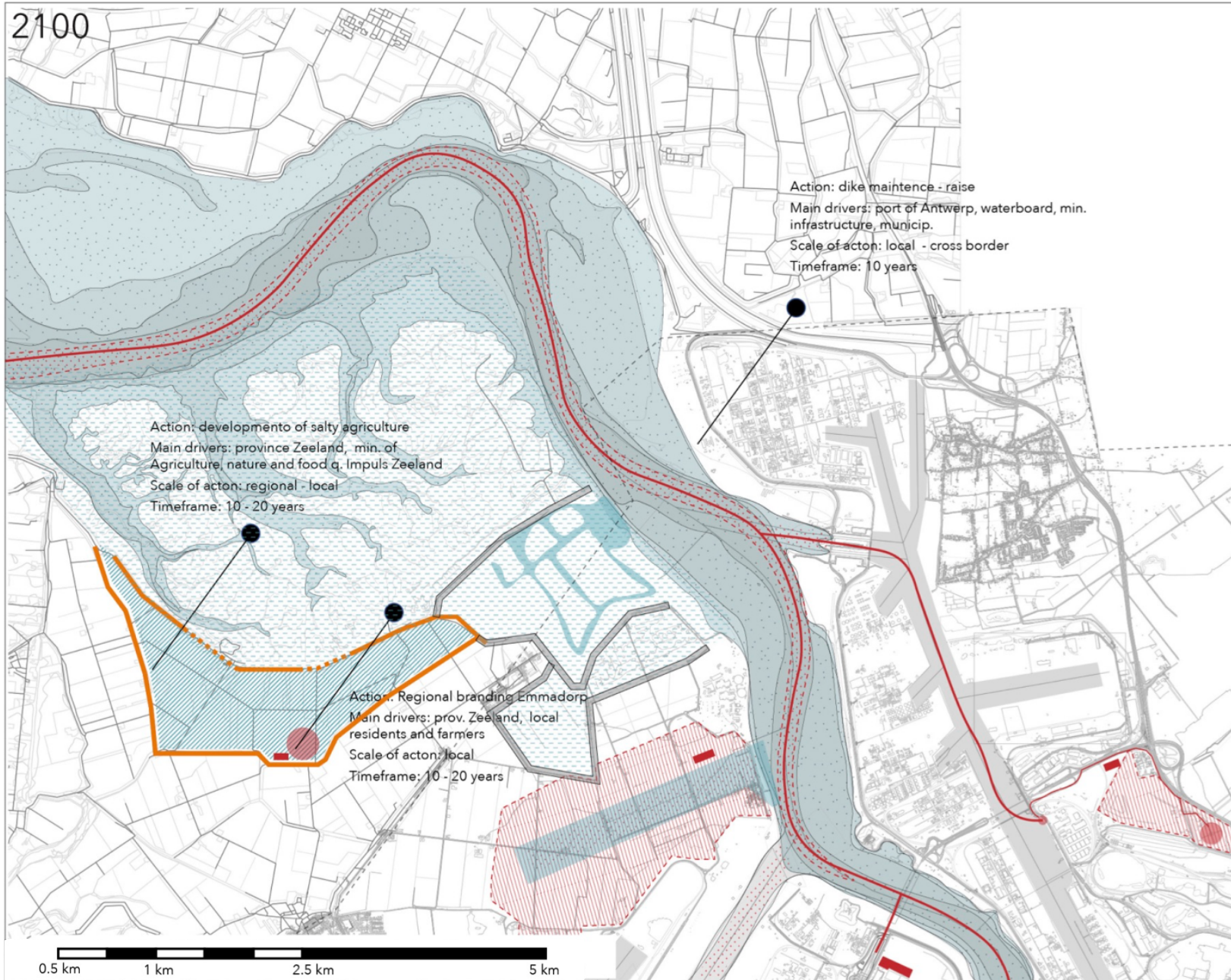
2050



DESIGN PROPOSAL: ZONE 3

EMMADORP - 2050

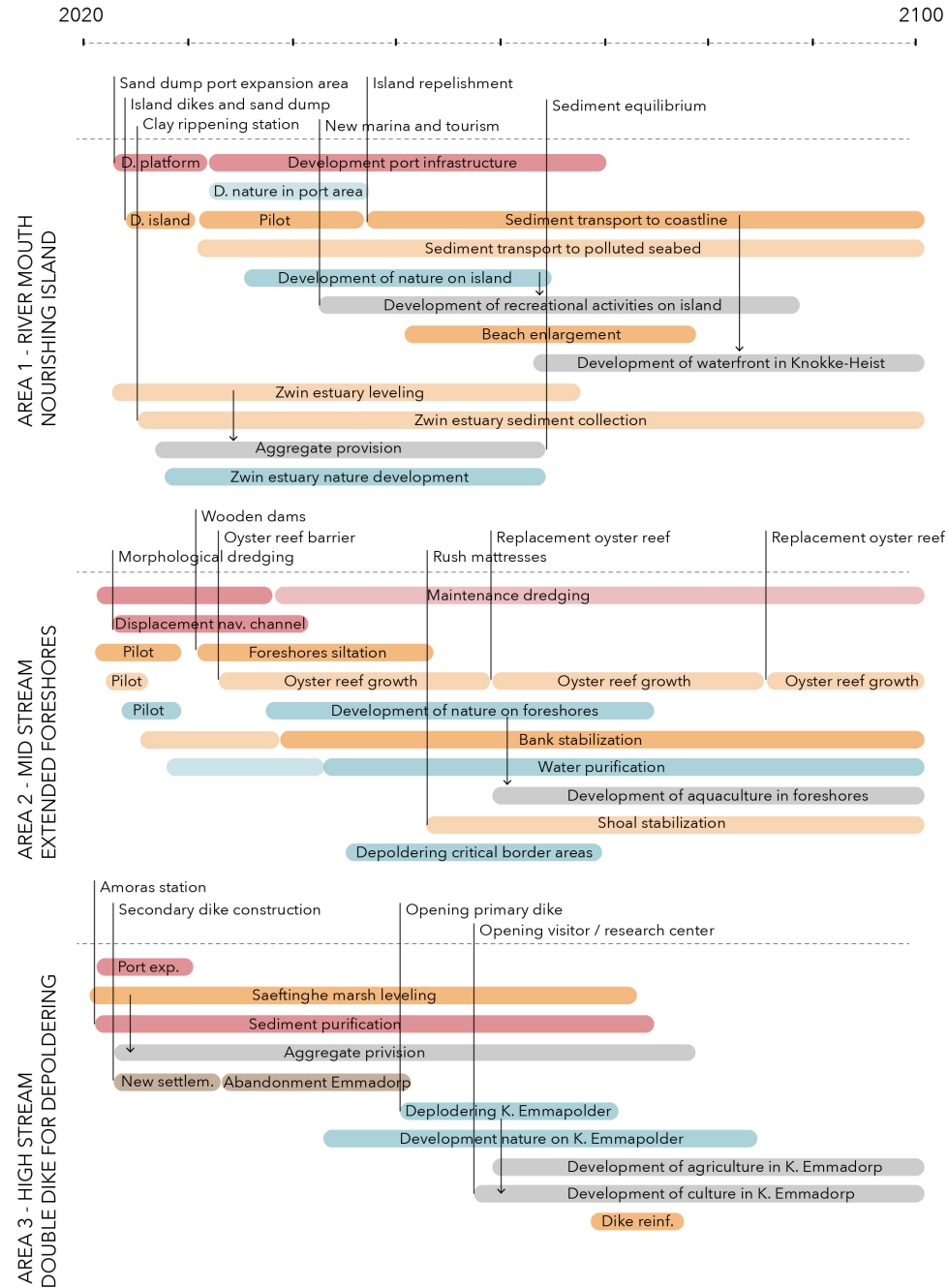
2100



DESIGN PROPOSAL: ZONE 3

EMMADORP - 2100

PROPOSAL: TIMELINE



GOVERNANCE

ADDED VALUE

(Horeca, beach sports, bathing)
Inner island coast and more recreation
(Eco-tourism, marina)

ECOLOGY

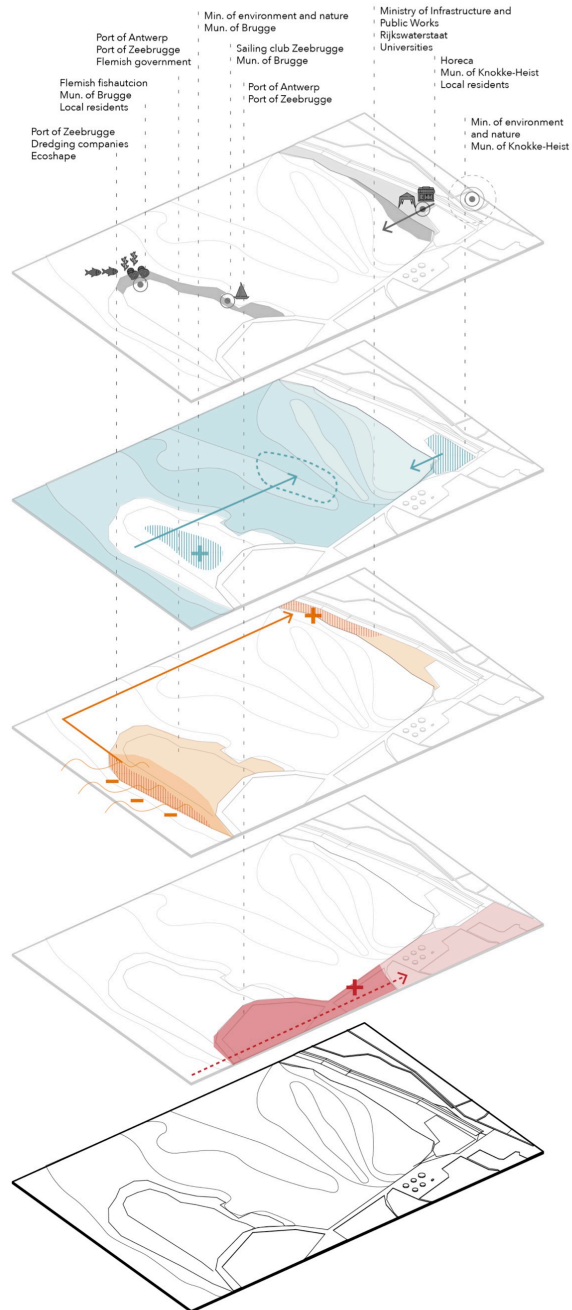
Compensation with high quality habitats
Coastal marsh expansion
Additional coverage of war pollution site

SAFETY

Wave breaker in front of coastline
Reduced coastal erosion
Low impact beach nourishment

ACCESSIBILITY

Shared infrastructure development
Increased seaport capacity
Decongestion on Western Scheldt



EVALUATION BENEFITS: ZONE 1

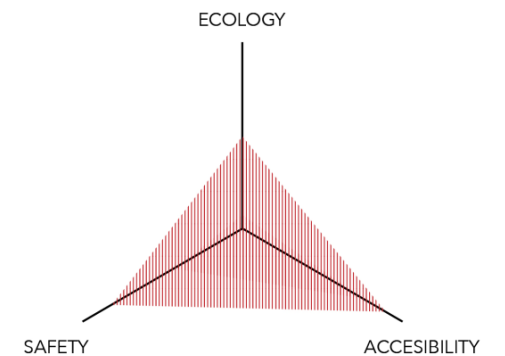


Figure 107: Exploded axonometric with added values for each system Zone 1
(Elaborated by author)

GOVERNANCE

ADDED VALUE

Biomass and biofuel products in foreshores
 Oyster harvesting in mid-term stage
 Food production in foreshores in long term stage

ECOLOGY

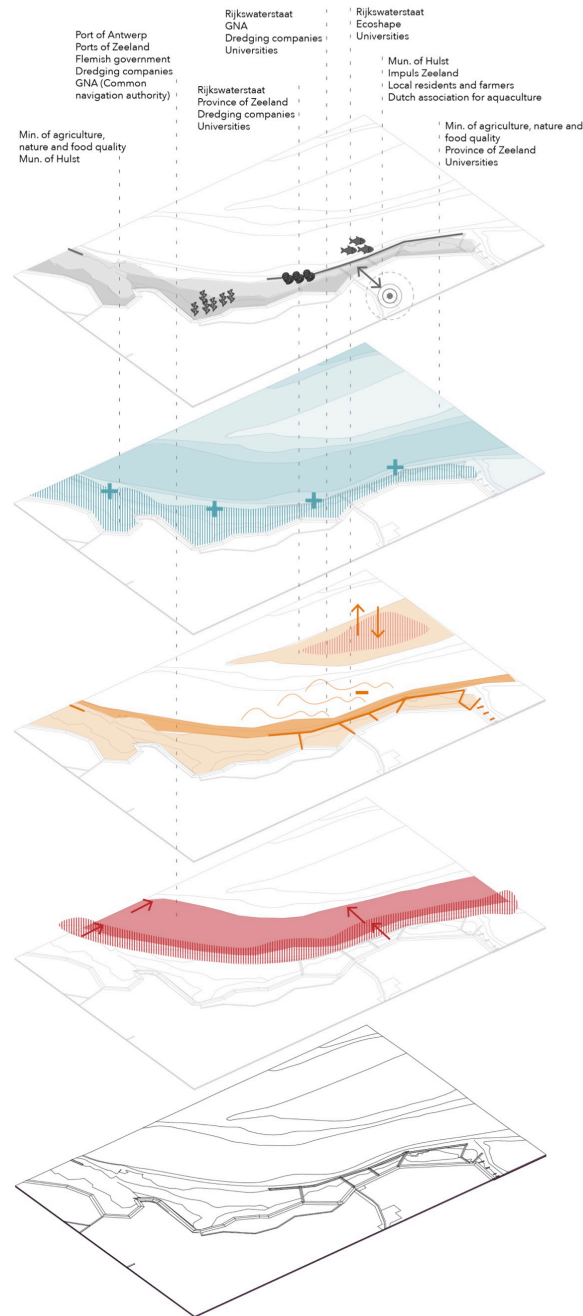
Ecosystems in vegetated foreshores
 Increased water, soil and air quality
 Integration nature-agriculture

SAFETY

River banks stability and reduced scouring
 Optimized mudflats elevation
 Wave dissipation

ACCESSIBILITY

Optimized navigation space
 Reduced nav. channel obstruction
 with loose sediments



EVALUATION BENEFITS: ZONE 2

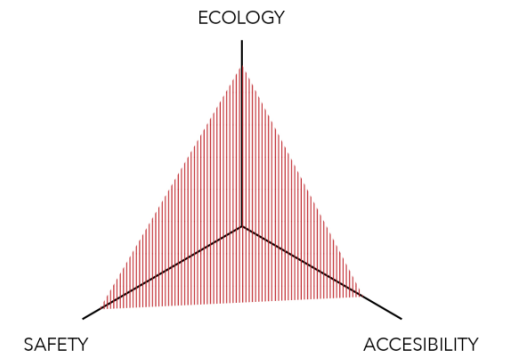


Figure 110: Exploded axonometric with added values for each system Zone 2 (Elaborated by author)

GOVERNANCE

ADDED VALUE

Salty agriculture in local identity
 Knowledge development
 Diversified ,low maintenance agriculture
 Silt based economies

ECOLOGY

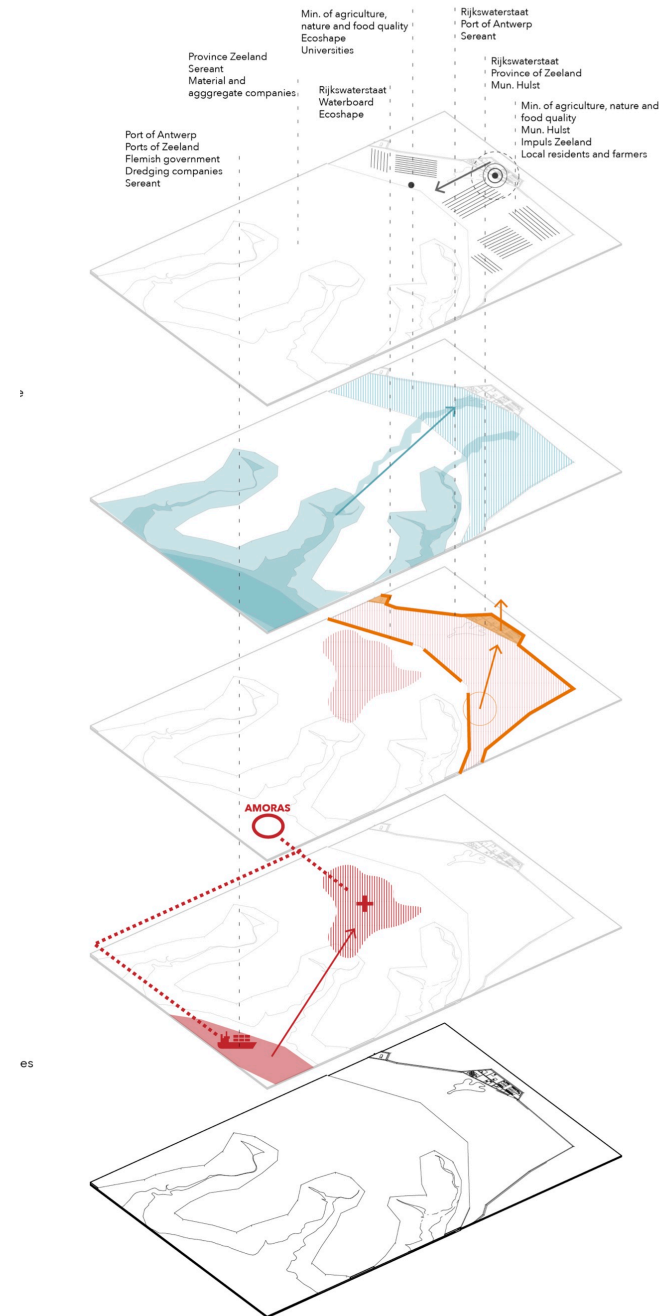
Increased tidal influence on marsh
 Extendend river and marsh space
 Integration nature-agriculture

SAFETY

Additional controlled flooding area
 More siface resistance for waves
 Relocation in higher and safer grounds

ACCESSIBILITY

Marsh collects more sediments
 Reduced dredging maintenance
 Sediment excess transfered for other uses



EVALUATION BENEFITS: ZONE 3

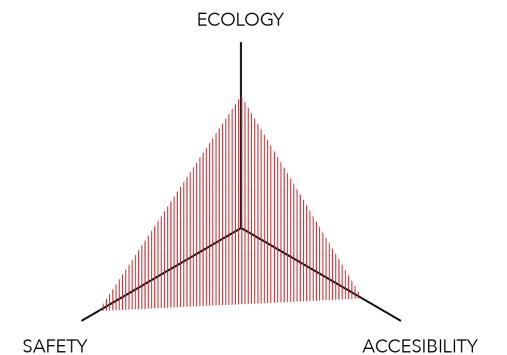
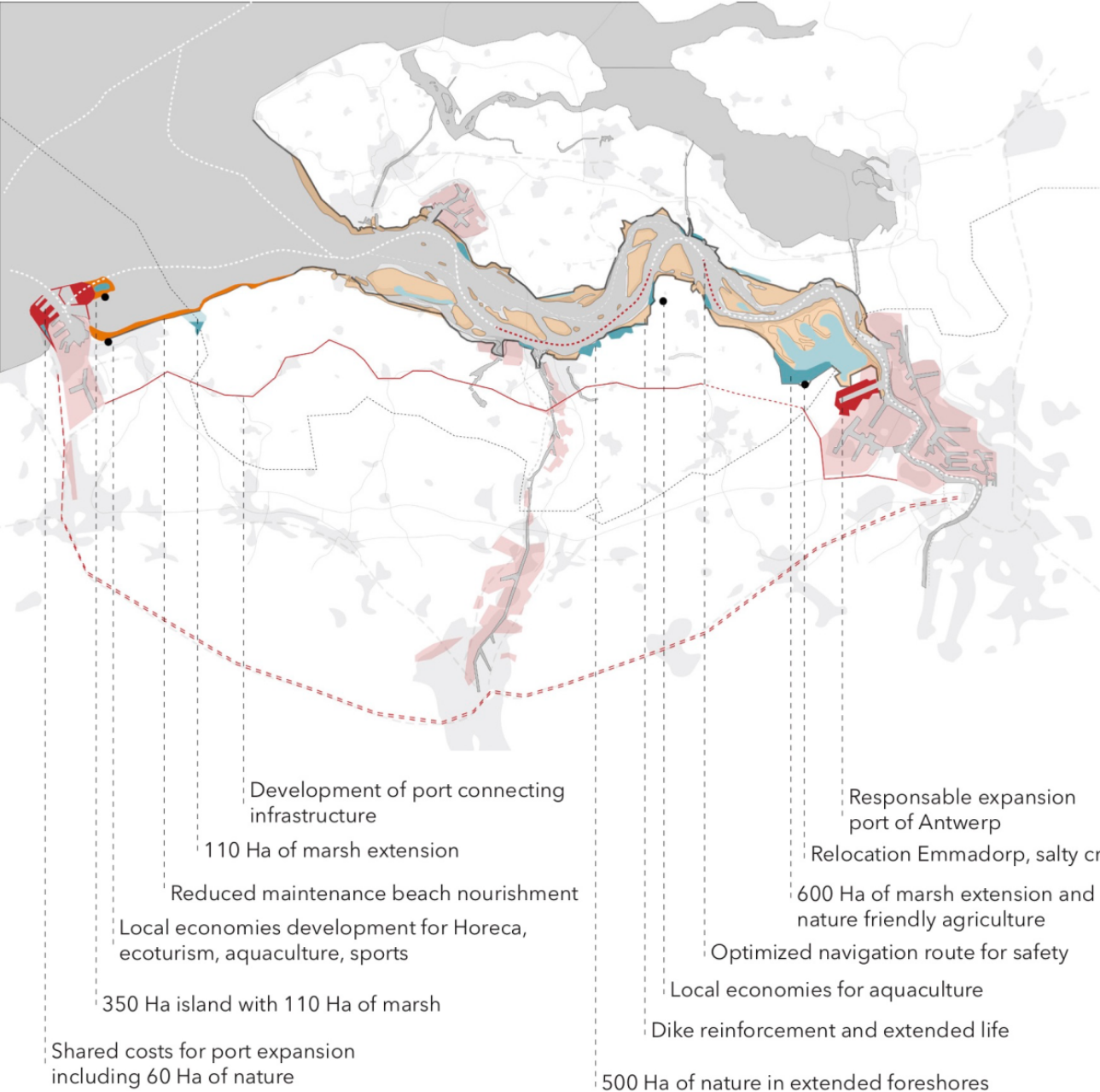


Figure 113: Exploded axonometric with added values for each system Zone 3 (Elaborated by author)

EVALUATION BENEFITS: SYSTEM

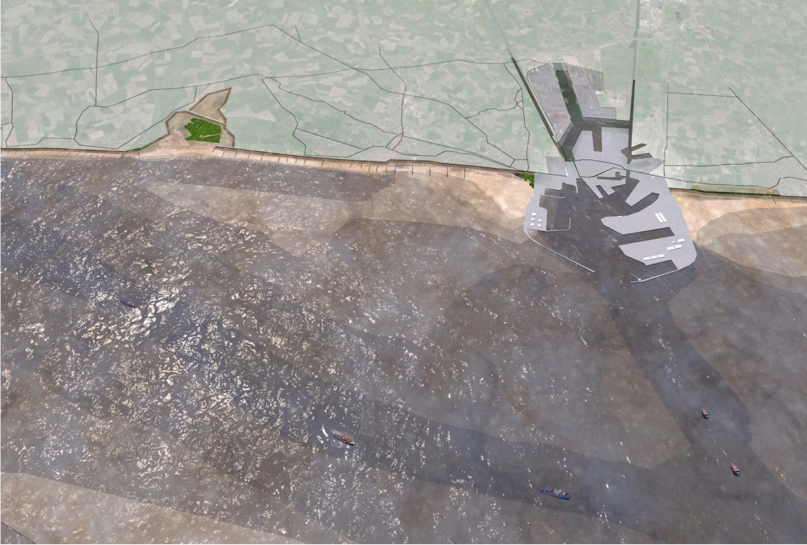


IMPROVED PERFORMANCE WESTERN SCHELDT:

- EXTENDED SAFETY WITH CURRENT DIKES
 - OVER 1400 HA OF NEW HABITATS
- MORE EFFICIENT TRANSPORTATION OF GOODS

EVALUATION: FUTURE WESTERN SCHELDT

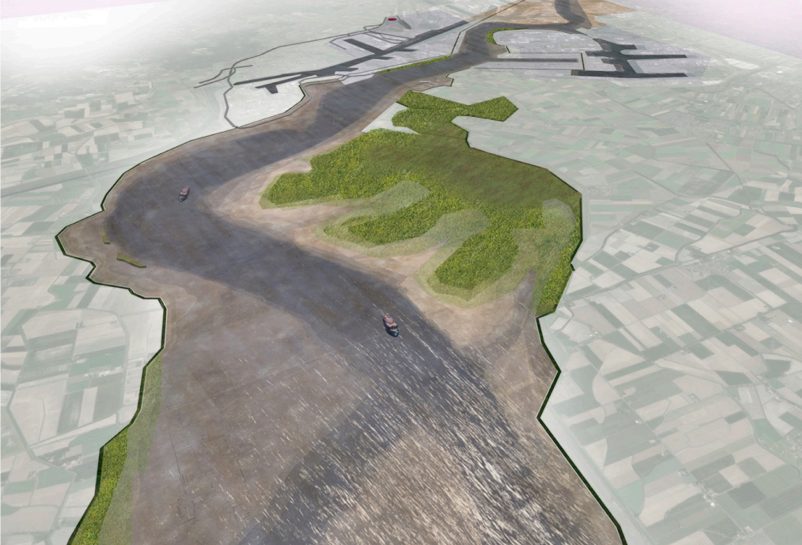
ZONE 1 TODAY



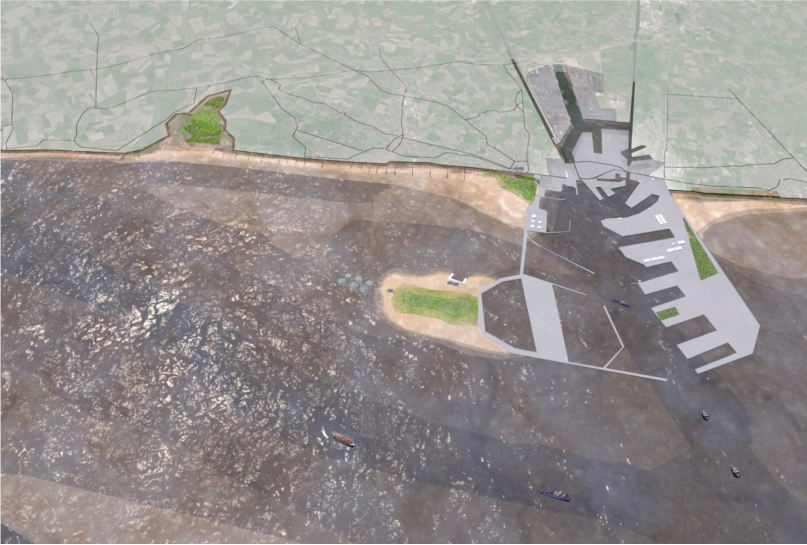
ZONE 2 TODAY



ZONE 3 TODAY



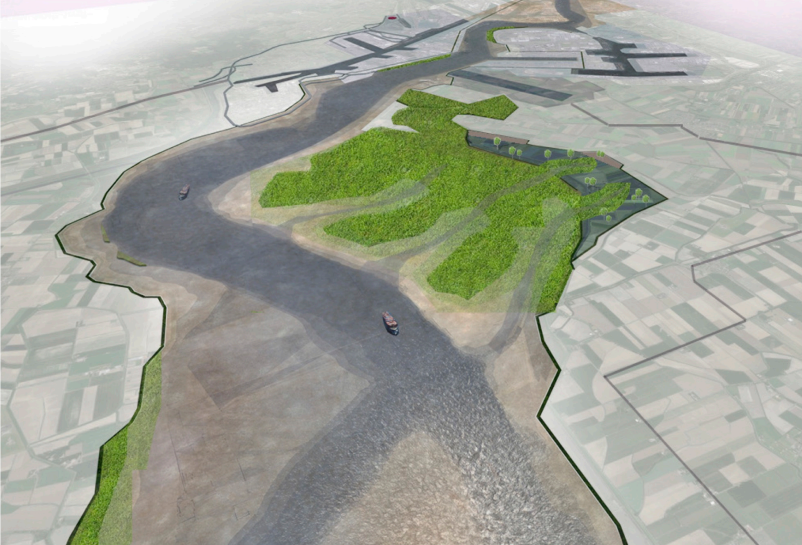
ZONE 1 IN 2100 WITH COLLABORATIVE STRATEGY FOR EBA



ZONE 2 IN 2100 WITH COLLABORATIVE STRATEGY FOR EBA



ZONE 3 IN 2100 WITH COLLABORATIVE STRATEGY FOR EBA

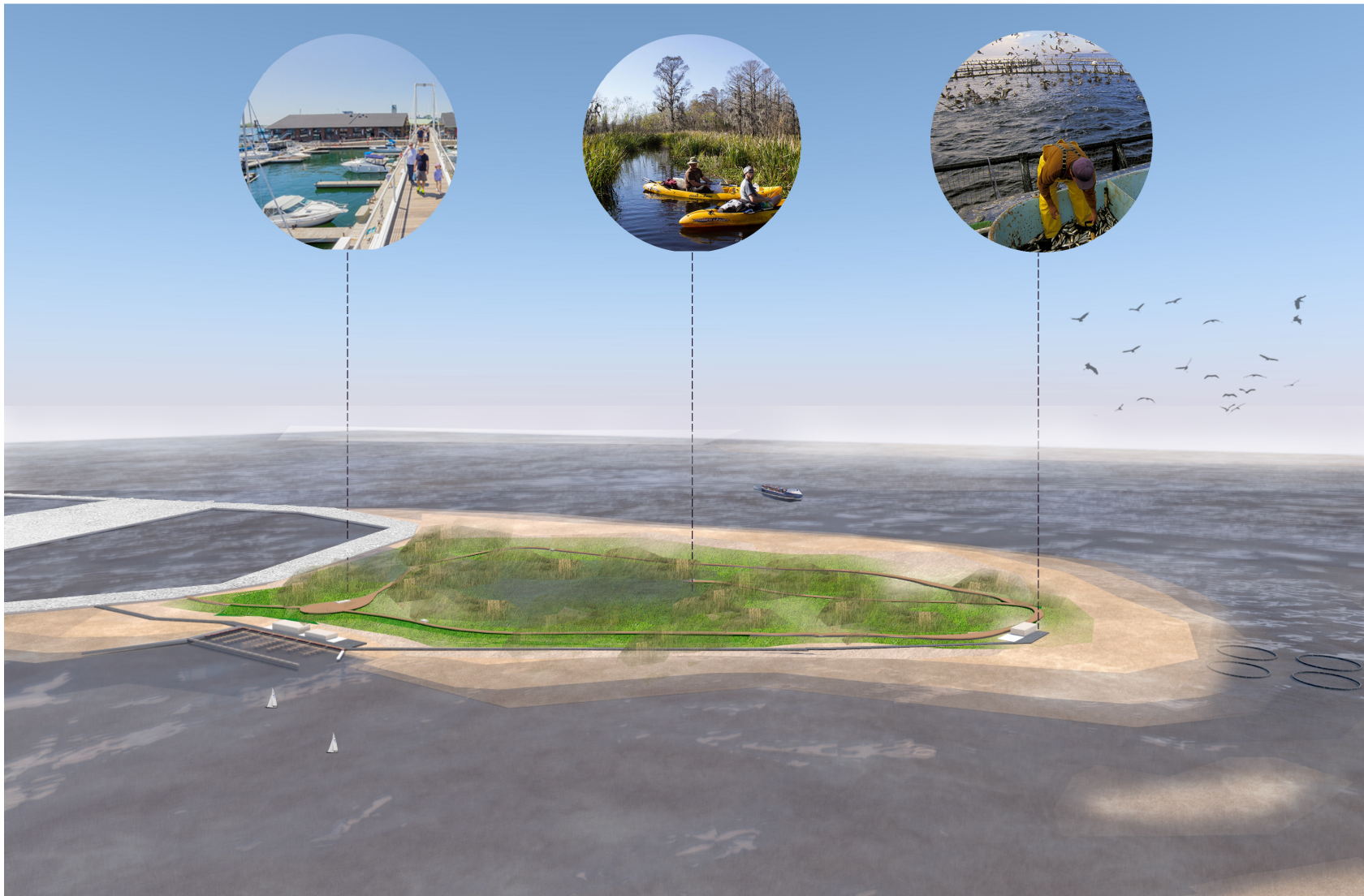


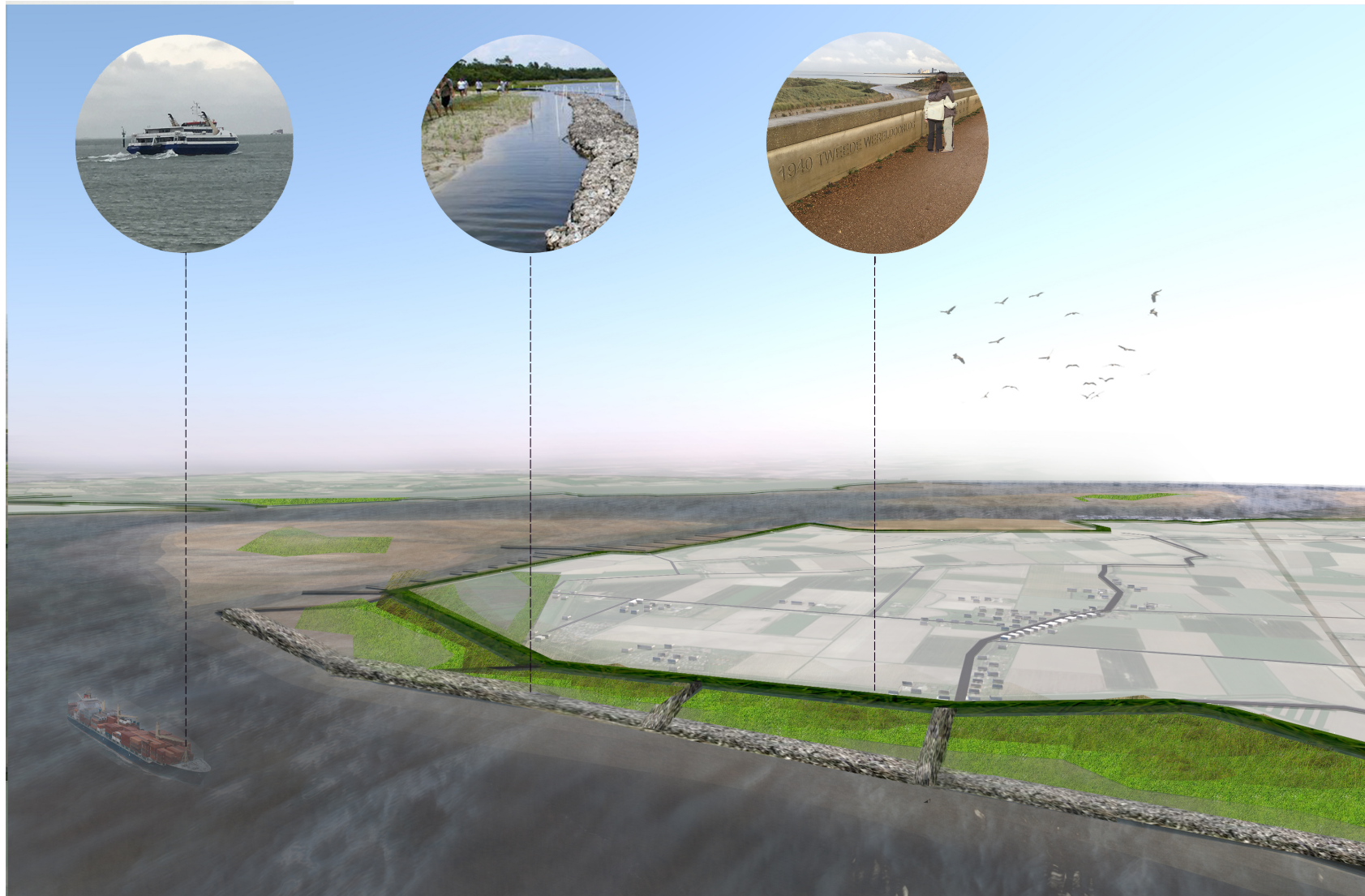
CONCLUSIONS

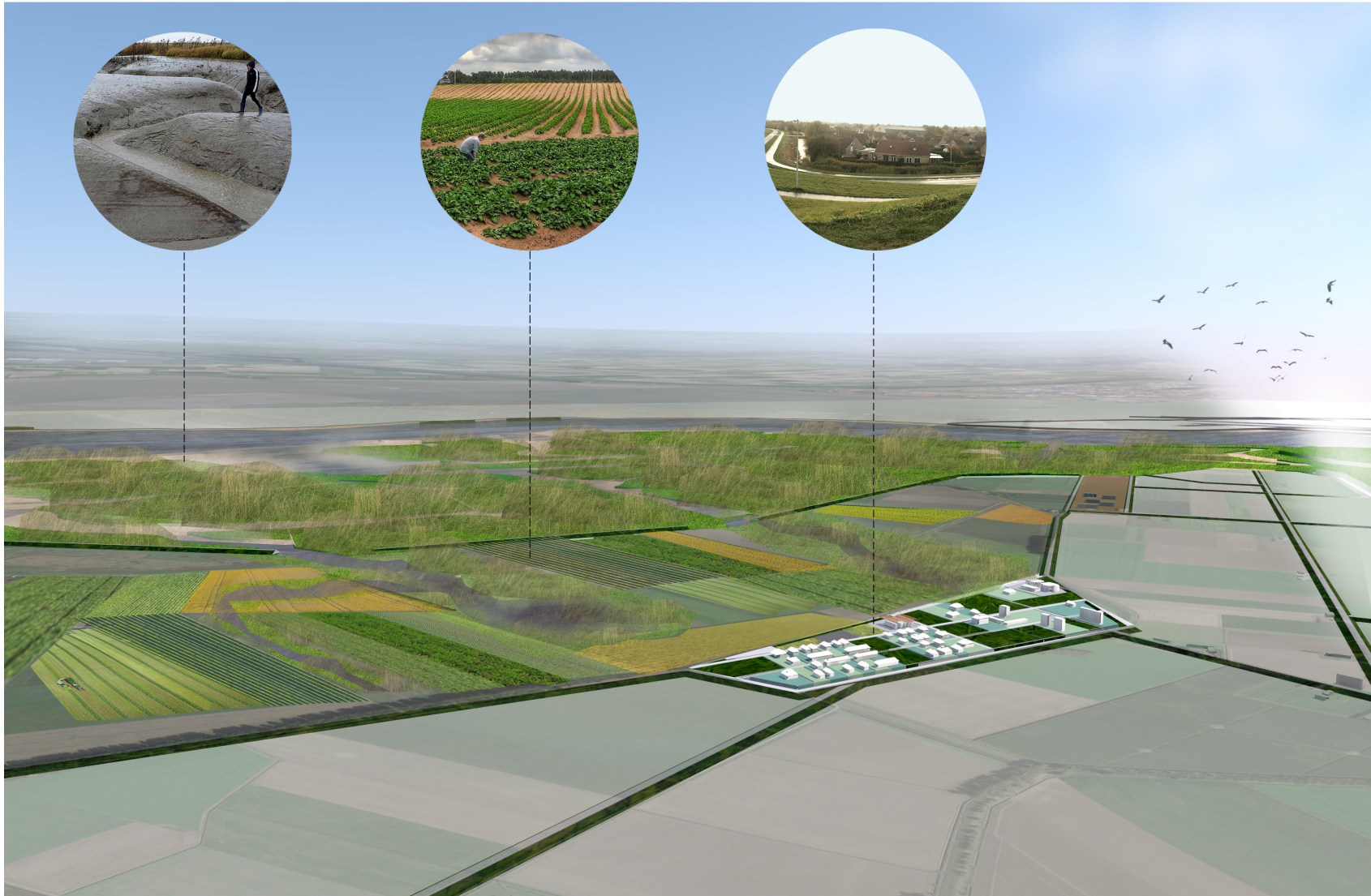
STAKEHOLDERS	PROPOSAL	GOVERNANCE ARRANGEMENT	OBJECTIVES
<ul style="list-style-type: none"> Rijkswaterstaat (RWS) (NL) Waterboards (NL) Ministry of mobility , public works, ... (BE) Ministry of agriculture, nature and food quality (NL) Ministry for ... environment and nature (BE) Environmental NGO's (NL/BE) Ecoshape (NL) Port of Antwerp (BE) Port of Zeebrugge (BE) Ports of Zeeland (NL/BE) Common Nautic Authority Western Scheldt (GNA) (NL/BE) Dredging companies (NL/BE) Western Scheldt Commission (NL/BE) Flemish government (BE) Province of Zeeland (NL) Municipalities (NL/BE) Local residents (NL/BE) Local businesses (NL/BE) Impuls Zeeland (NL) Universities and research facilities (NL/BE) 	<p>River mouth - Sand-nourishing island</p> <p>Mid stream - Extended foreshores</p> <p>High stream - Depoldering and controlled flooding area</p>	<p>REGIONAL DRIVERS</p> <ul style="list-style-type: none"> Western Scheldt Commission Port of Antwerp/Zeebrugge RWS/ Ministry of public works Ministry of nature Provincial government <p>REGIONAL SUPPORTERS</p> <ul style="list-style-type: none"> Ecoshape Waterboards NGO's Nautic authority (GNA) Dredging companies Universities, research facilities <p>LOCAL INVESTMENT (COAST)</p> <ul style="list-style-type: none"> Region of Flanders Municipality of Brugge Municipality of Knokke-Heist Municipality of Sluis Private investors (Horeca, Sailing clubs, Food producers, Tourism, Beach leisure) <p>LOCAL INVESTMENT (MID STREAM)</p> <ul style="list-style-type: none"> Region of Flanders Nautic authority (GNA) Municipality of Hulst Municipality of Vlissingen Municipality of Terneuzen Municipality of Reimerswaal Impuls Zeeland Private investors (Food producers, pharmaceutical, leisure, bio fuel/ biogas/ energy) <p>LOCAL INVESTMENT (HIGH STREAM)</p> <ul style="list-style-type: none"> Province of Zeeland Municipality of Hulst Municipality of Antwerp Municipality of Beveren Impuls Zeeland Private investors (Food production, agri-tech, leisure, construction materials) 	<p>SAFETY:</p> <ul style="list-style-type: none"> - Low-maintenance nourishment - Wave dissipation <p>ECOLOGY:</p> <ul style="list-style-type: none"> - Increased valuable habitats - Zwin estuary improvement <p>ACCESSIBILITY:</p> <ul style="list-style-type: none"> - Shared infrastructure development - Reduced traffic in Western Scheldt <p>EXPANDED:</p> <ul style="list-style-type: none"> - Beachfront expansion and development <p>SAFETY:-</p> <ul style="list-style-type: none"> - Dike reinforcement - mWave dissipation <p>ECOLOGY:</p> <ul style="list-style-type: none"> - Increased valuable habitats - Improved ecological network - Mudflat maintenance <p>ACCESSIBILITY:</p> <ul style="list-style-type: none"> - Optimized navigation space - Reduced unstable material on riverbed <p>EXPANDED:</p> <ul style="list-style-type: none"> - Network of leisure spaces along river - Local resources for food and energy <p>SAFETY:</p> <ul style="list-style-type: none"> - Increased river space - Wave dissipation <p>ECOLOGY:</p> <ul style="list-style-type: none"> - Increased valuable habitats - Integration nature and agriculture <p>ACCESSIBILITY:</p> <ul style="list-style-type: none"> - Sediment based economies - Reduced maintenance dredging <p>EXPANDED:</p> <ul style="list-style-type: none"> - Low maintenance and nature friendly agriculture - Identity based on the marsh and ecology

- EBA DESIRABLE PATHWAY TO DEAL WITH THE INTERDEPENDENCY OF THE SYSTEMS
- EBA IS COST-EFFECTIVE, COMPLEMENTARY AND ADAPTIVE
- THE GOVERNANCE FOR EFFECTIVE IMPLEMENTATION OF EBA SHOULD ALSO BE ADAPTIVE AND EVOLVE IN PARALLEL TO THE CHANGES IN THE ECOSYSTEMS AND THEIR PROCESSES
- THE GOVERNANCE ADAPTABILITY WILL INFLUENCE THE DEFINITION OF SITE-SPECIFIC CONDITIONS AND VERTICAL AND HORIZONTAL STAKEHOLDER ARRANGEMENTS OVER TIME.
- THE PROPOSED GOVERNANCE STRUCTURE FOR EBA -THE WESTERN SCHELDT COMMISSION TRANSMITTING VALUES OF EBA TO STAKEHOLDERS, USING COMPENSATION REQUIREMENTS FOR POTENTIAL PROJECTS AND INCREASE THE ROLE OF RESEARCH IN THE ADAPTIVE RESPONSE OF GOVERNANCE.

THANK YOU!







8.1 SOCIETAL RELEVANCE:

- Increase environmental consciousness of society
- More involvement, knowing what is at stake, support these projects and contribute to maintain them
- Societal engagement is part of the local level management strategies
- Combining nature preservation with other goals, we can increase stakeholder engagement and availability of resources

8.2 SCIENTIFIC RELEVANCE:

- The extension of ecosystems frequently does not align with the traditional administrative divisions of governance. Large scales and time frames of natural processes require new arrangements of governance that recognize the site- specific conditions, defines the optimal scales to operate and includes the corresponding stakeholders in the process of decision-making.
- This flexibility should also facilitate the exchange of perspectives, knowledge and resources within the scope of each project in order to make well-informed decisions and reduce trade- offs.
- Planning coordination can then facilitate operatizing ecosystem management via small- scale projects and interventions that can also contribute to a long-term vision and the improvement of the natural systems at their territorial dimension.
- Natural dynamics change at a slow paste, but can provide many benefits and be cost- effective. For this reason, we have to find ways to incorporate them in planning not only as a goal, but how to make it possible.

8.3 ETHICAL CONSIDERATIONS:

- Trade offs: These projects will have to deal with the connection and conflicts between who knows about preserving ecosystems, who makes decisions and who wins/loses as a result.-
- Authorship of the interventions.