

Mixed actions

Final report:

**TOWARDS
A SPATIAL STRUCTURE PLAN FOR
SUSTAINABLE MANAGEMENT
OF THE SEA
PART TWO: MAPS
MA/02/006**

Coordinator and promotor:

Prof. Dr. F. Maes, Maritime Institute, University Gent

Promoters:

Prof. Dr. M. De Batist/Dr. V. Van Lancker, Renard Center of Marine
Geology, University Gent

Ir. D. Leroy, Ecolas nv

Prof. Dr. M. Vincx, Marine Biology Section, University Gent



Renard Centre of Marine Geology



June 2005

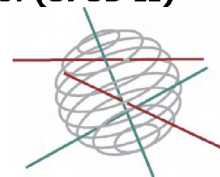


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Rue de la Science 8
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B-1000 Brussels
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Tel: +32 (0)2 238 34 11 – Fax: +32 (0)2 230 59 12
<http://www.belspo.be>

Contact person:
Mr David Cox
Secretariat: +32 (0)2 238 36 13

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Map I.O. Joint presentation of all spatial distribution maps



Original data source: cfr. all spatial distribution maps

Map preparation: RCMG - Ghent University

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Map I.1.1a. Legal zonation in the Belgian part of the North Sea



- Baseline
- - - 3 nautical mile
- - - 6 nautical mile
- . . 12 nautical mile: Belgian territorial sea
- - - 24 nautical mile: Contiguous zone
- Belgian part of the North Sea including continental shelf and exclusive economic zone

0 2.5 5 10 km

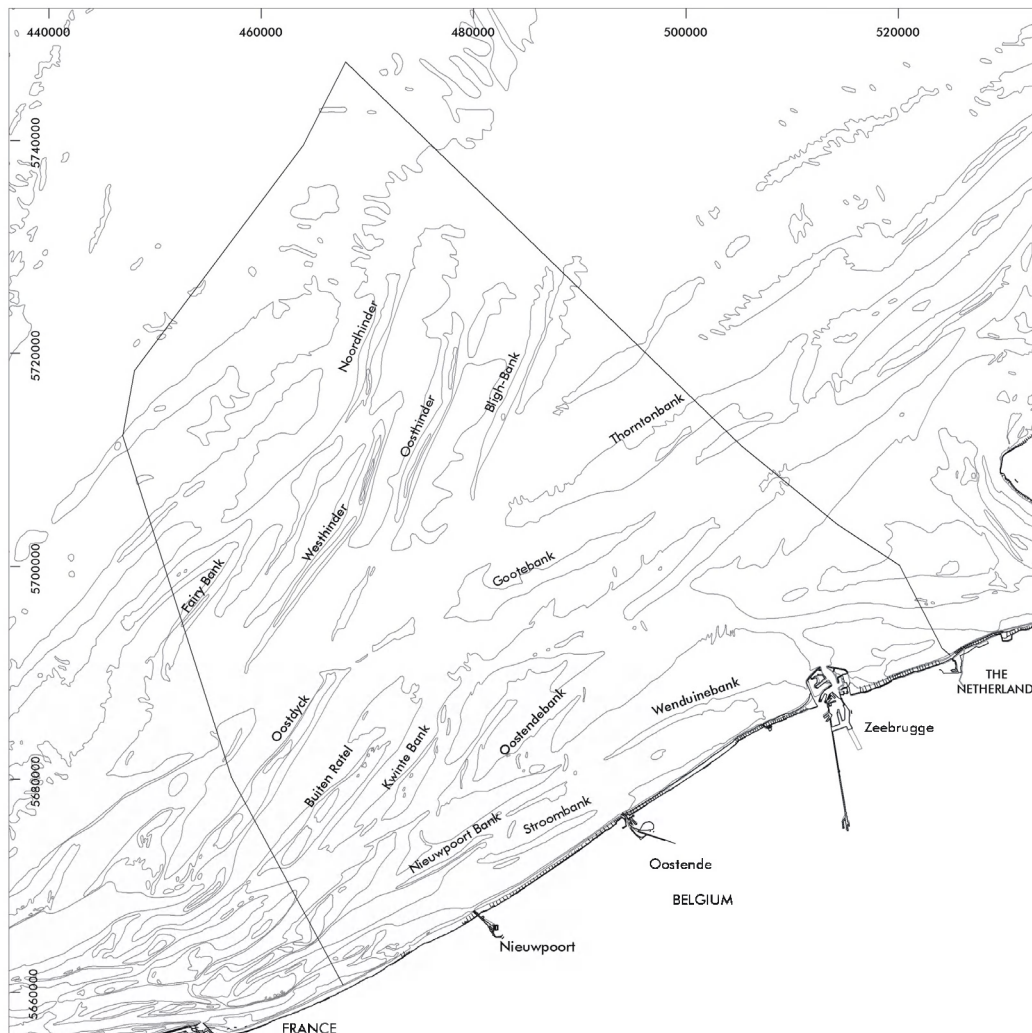
UTM31N - WGS84 coordinates

Original data source: Maes et al., 2000. Limited Atlas of the Belgian Part of the North Sea, OSTC, 31 pp.
Map preparation: RCMG - Ghent University

May 2005



Map I.1.2a. Bathymetry of the Belgian part of the North Sea

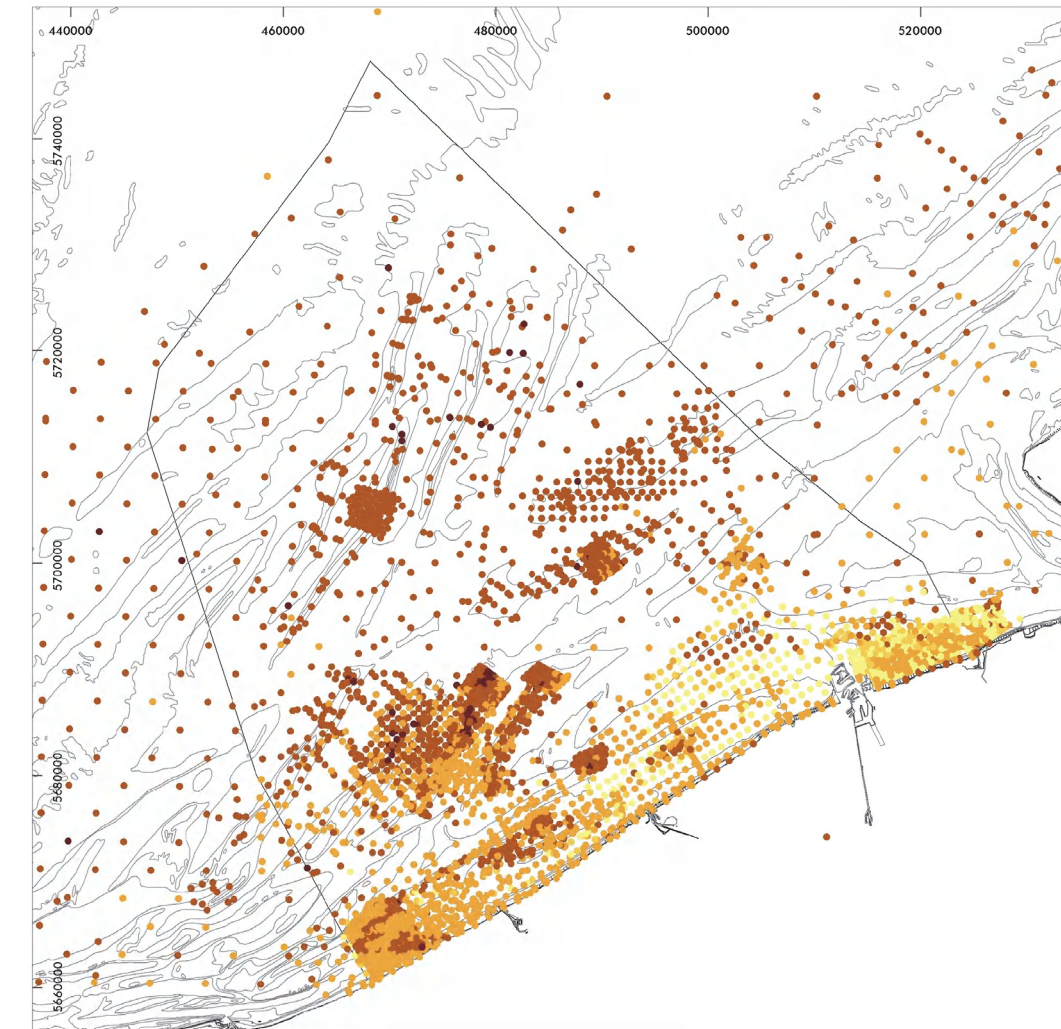


Original data source: Ministry of the Flemish Community, Department of Environment and Infrastructure, Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office
 Map preparation: RCMG - Ghent University

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Map I.1.2b. Distribution of the surficial sediment sampling points. The colour gives an indication of their median grain-size (based on sedisurf@ database (1976-)



Median grain size (μ)

- 0 - 63
- 63 - 125
- 125 - 250
- 250 - 500
- > 500

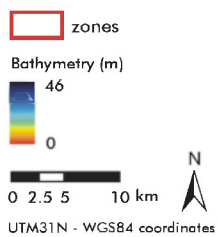
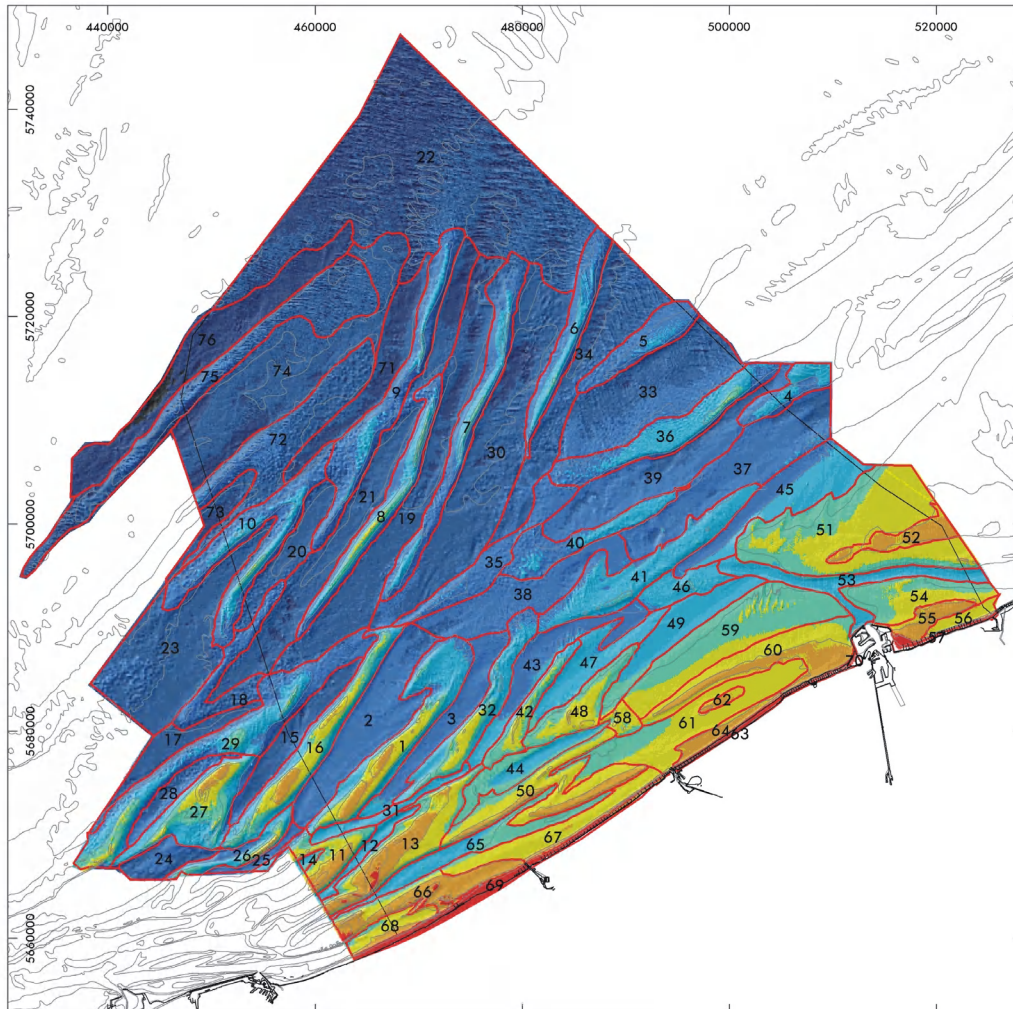
0 2.5 5 10 km
UTM31N - WGS84 coordinates

Original data source: Sedisurf database, Renard Centre
of Marine Geology - Ghent University
Map preparation: RCMG - Ghent University

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Map I.1.2c. Zonation of the Belgian part of the North Sea, superimposed on a bathymetry-based digital terrain model



Original data source: Ministry of the Flemish Community, Department of Environment and Infrastructure, Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office

Hydrographic Office of the Netherlands
United Kingdom Hydrographic Office

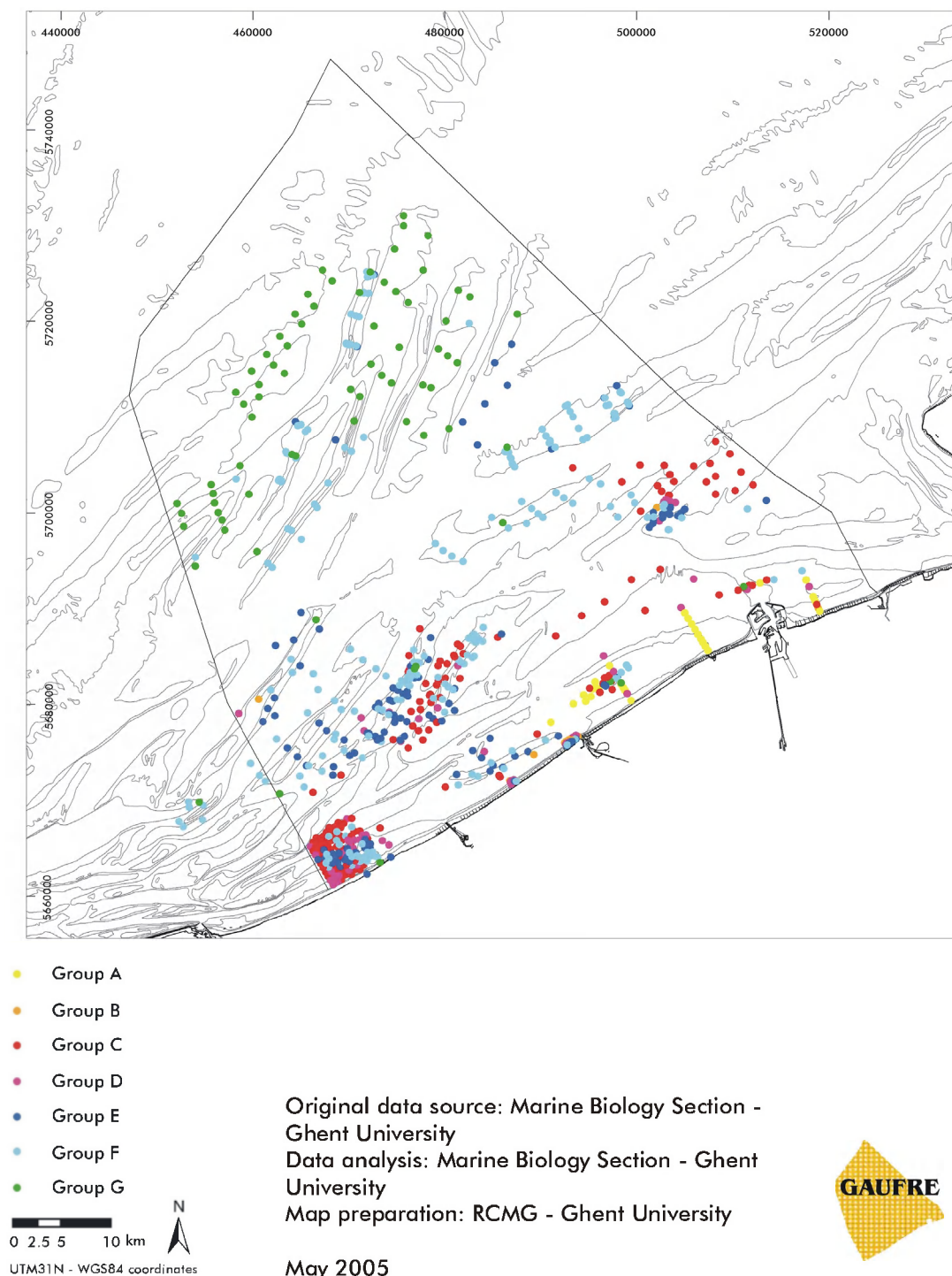
Data analysis: RCMG - Ghent University

Map preparation: RCMG - Ghent University

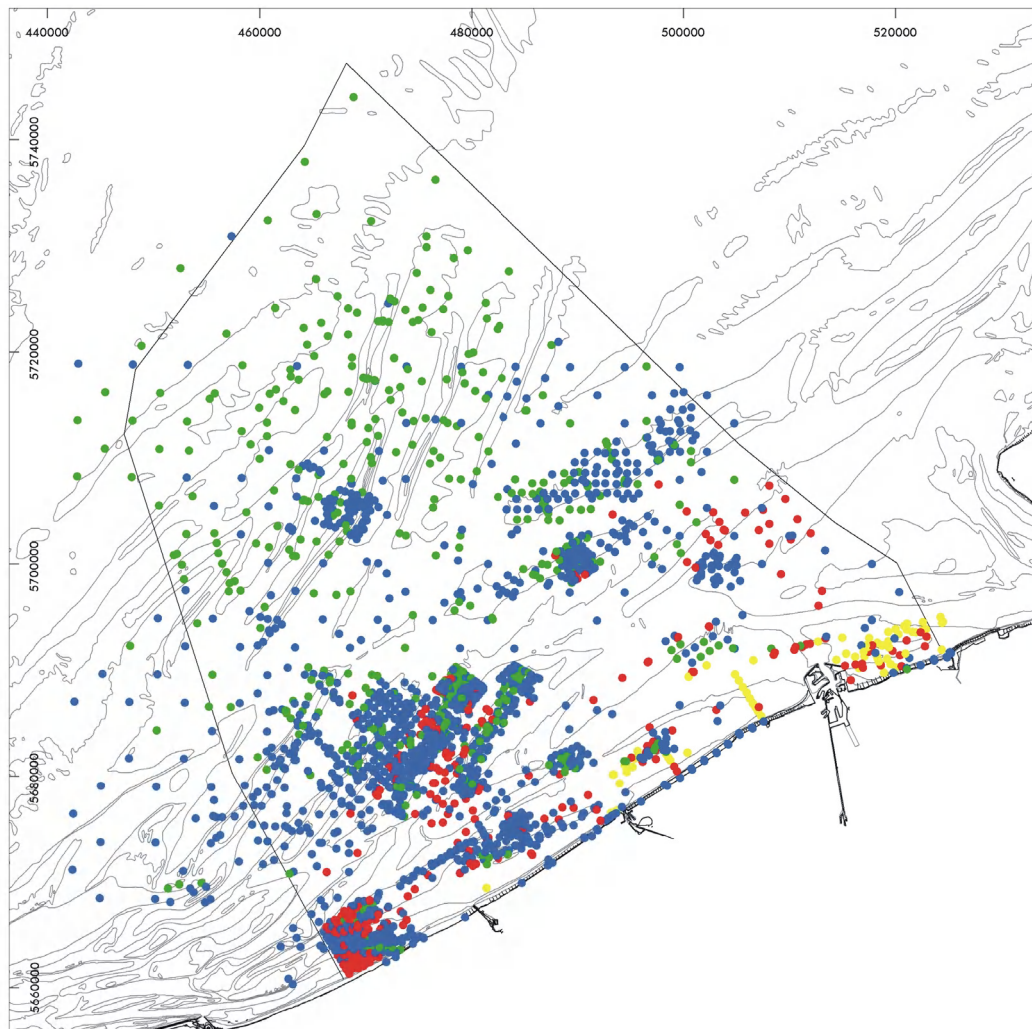
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Map I.1.3a. Spatial distribution of the sample groups at the BPNS



Map I.1.3b. Spatial distribution of the four soft-sediment macrobenthic communities in the Belgian part of the North Sea, based on direct (i.e. macrobenthos samples) as well as modeled



- *Macoma balthica* community
- *Abra alba* - *Mysella bidentata* community
- *Nephtys cirrosa* community
- *Ophelia limacina* - *Glycera lapidum* community

0 2.5 5 10 km
 UTM31N - WGS84 coordinates

Original data source: Marine
 Biology Section - Ghent University
 RCMG - Ghent University
 Data analysis: Marine Biology
 Section - Ghent University
 RCMG - Ghent University
 Map preparation: RCMG -
 Ghent University

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Map I.2.1a. Cables and pipelines: spatial distribution



— Pipelines

Cables:

— In use

- - Disuse

0 2.5 5 10 km

UTM31N - WGS84 coordinates

Original data source: Federal Public Service Economy, SMEs,
Self-employed and Energy
Ministry of the Flemish Community, Department of Environment
and Infrastructure, Waterways and Marine Affairs
Administration, Division Coast, Hydrographic Office
Map preparation: RCMG - Ghent University

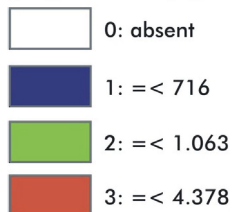
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Map I.2.1b. Cables: use intensity



Use intensity of cables
(length of cable (m)/km²)



0 2.5 5 10 km

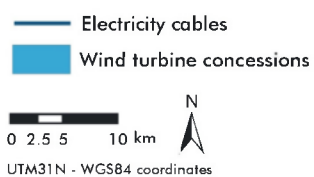
UTM31N - WGS84 coordinates

Original data source: Federal Public Service
Economy, SMEs, Self-employed and Energy
Ministry of the Flemish Community, Department
of Environment and Infrastructure, Waterways
and Marine Affairs Administration, Division
Coast, Hydrographic Office
Data analysis: RCMG - Ghent University
Map preparation: RCMG - Ghent University

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Map I.2.2a. Energy: spatial distribution



Original data source: C-power NV
TV Electrabel - Ondernemingen Jan de Nul
(Project Seanergy)
Map preparation: RCMG - Ghent University

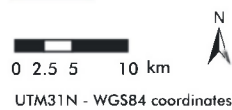
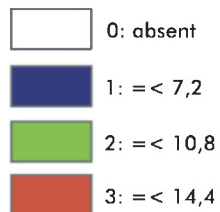
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Map I.2.2b. Wind turbines: use intensity



Use of intensity of windturbine parks
(megawatt/km²)



Original data source: C-power NV
TV Electrabel - Ondernemingen Jan De Nul
(Project Seanergy)
Data analysis: ECOLAS NV
RCMG - Ghent University
Map preparation: RCMG - Ghent University

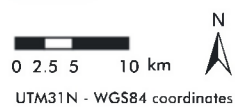
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Map I.2.2c. Electricity cables for wind turbines: use intensity



Use intensity of windenergy electricity cables
(length of cable (m)/km²)

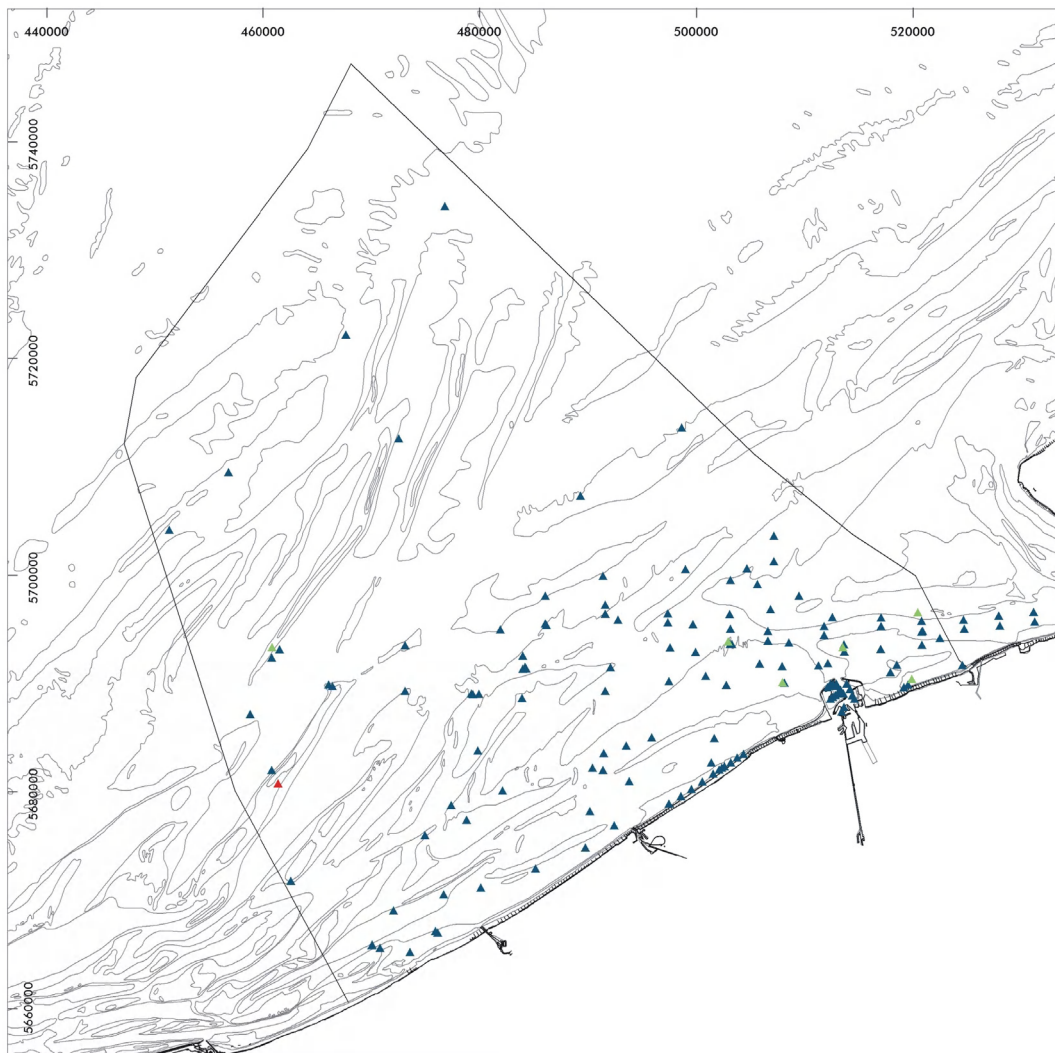


Original data source: C-power NV
TV Electrabel - Ondernemingen Jan De Nul
(Project Seanergy)
Data analysis: ECOLAS NV, RCMG - Ghent University
Map preparation: RCMG - Ghent University

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Map I.2.4a. Weather and radar masts, and buoys: spatial distribution



▲ Weather masts
 ▲ Buoys
 ▲ Radar mast Oost Dyck

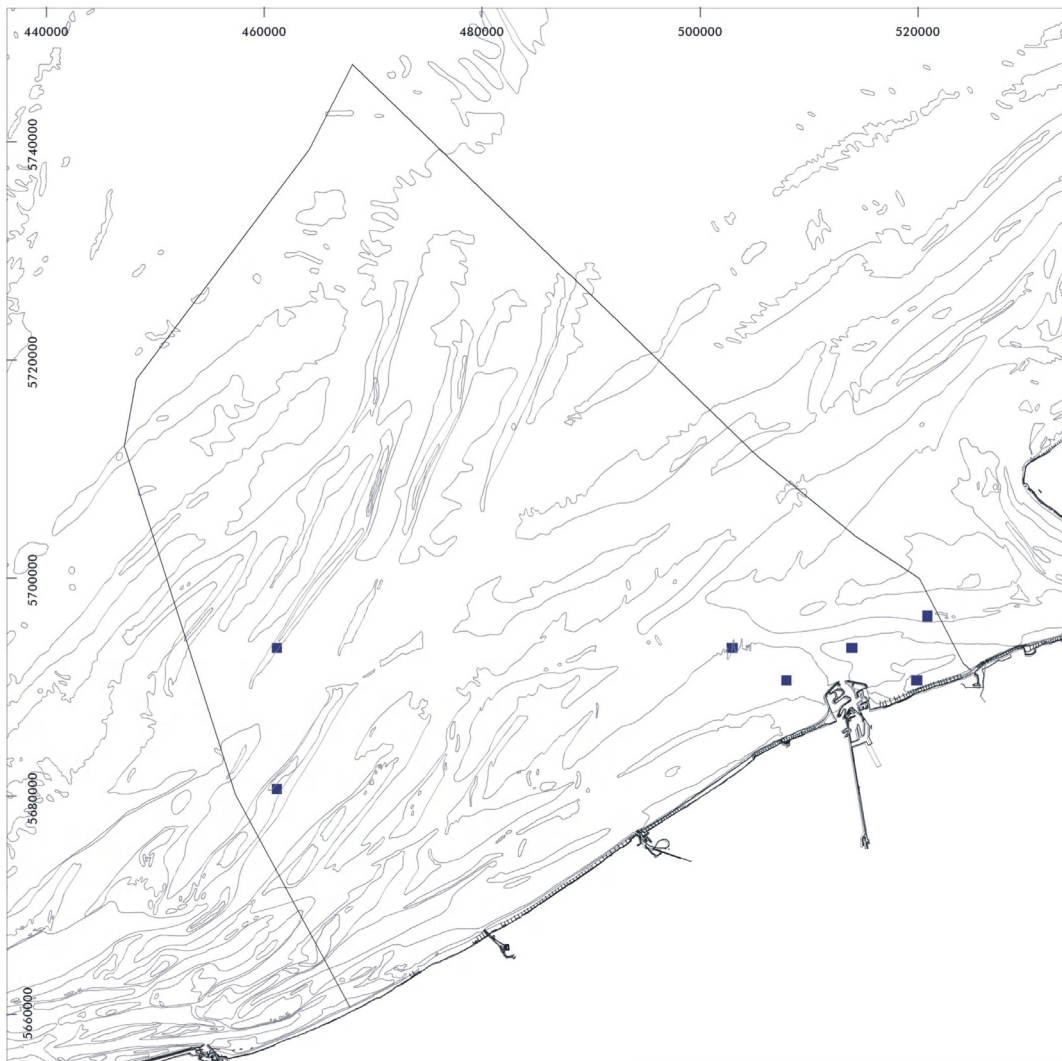
0 2.5 5 10 km
 UTM31N - WGS84 coordinates

Original data source: Ministry of the Flemish Community, Department of Environment and Infrastructure, Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office & Hydrometeo, "Overview of positions (WGS84) weather masts and radar mast Oost Dyck on nautical maps"
 Map preparation: RCMG - Ghent University

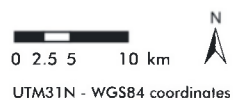
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Map I.2.4b. Weather and radar masts: use intensity



Spatial distribution and use intensity of weather and radar masts
(number of weather and radar masts/km²)

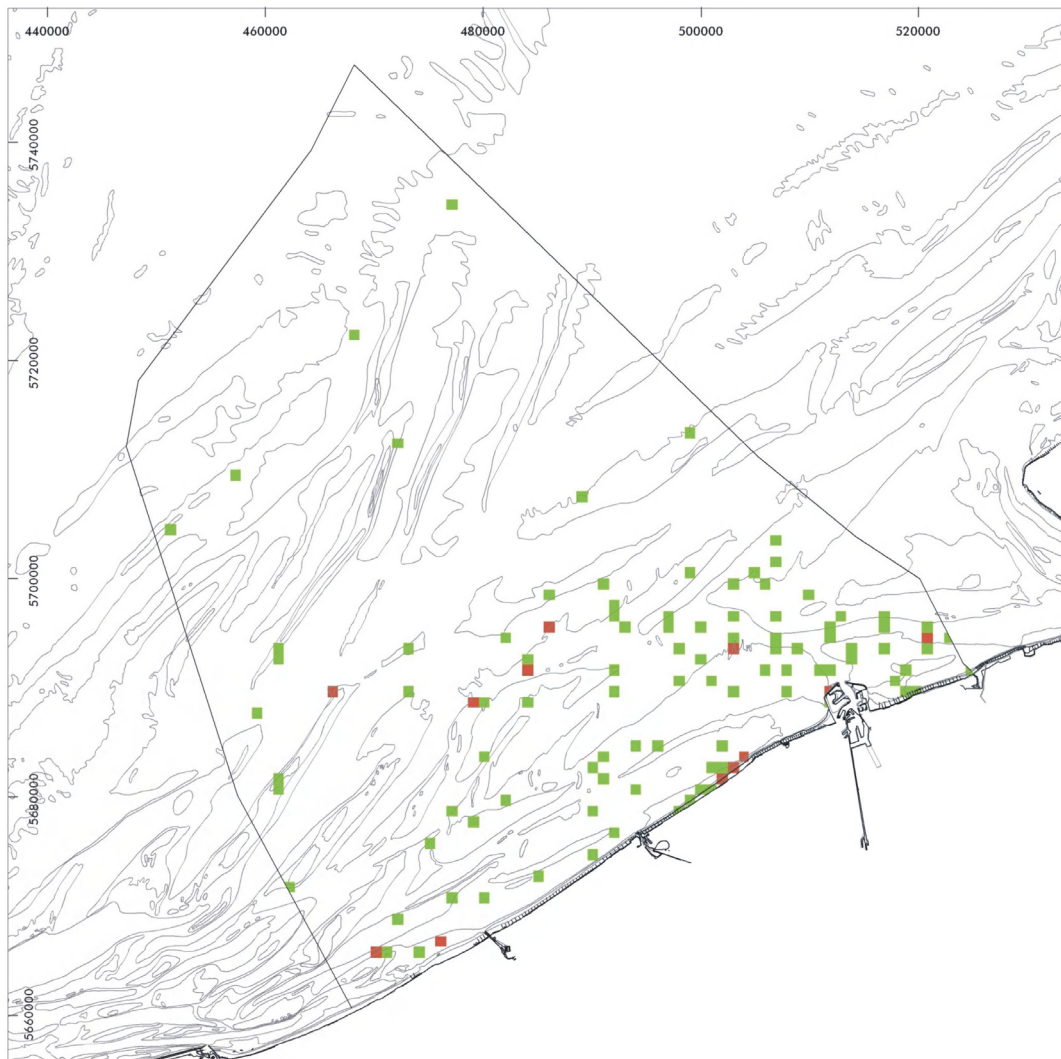


Original data source: Ministry of the Flemish Community,
Department of Environment and Infrastructure, Waterways
and Marine Affairs Administration, Division Coast, Hydrographic
Office & Hydrometeo, "Overview of positions (WGS84) weather
masts and radar mast Oost Dyck on nautical maps"
Data analysis: Maritime Institute - Ghent University,
RCMG - Ghent University
Map preparation: RCMG - Ghent University

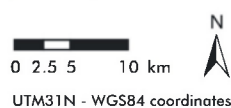
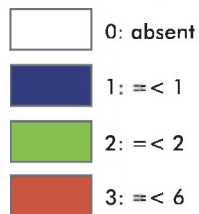


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Map I.2.4c. Buoys: use intensity



Spatial distribution and use intensity of buoys
(number of buoys/km²)



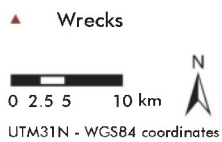
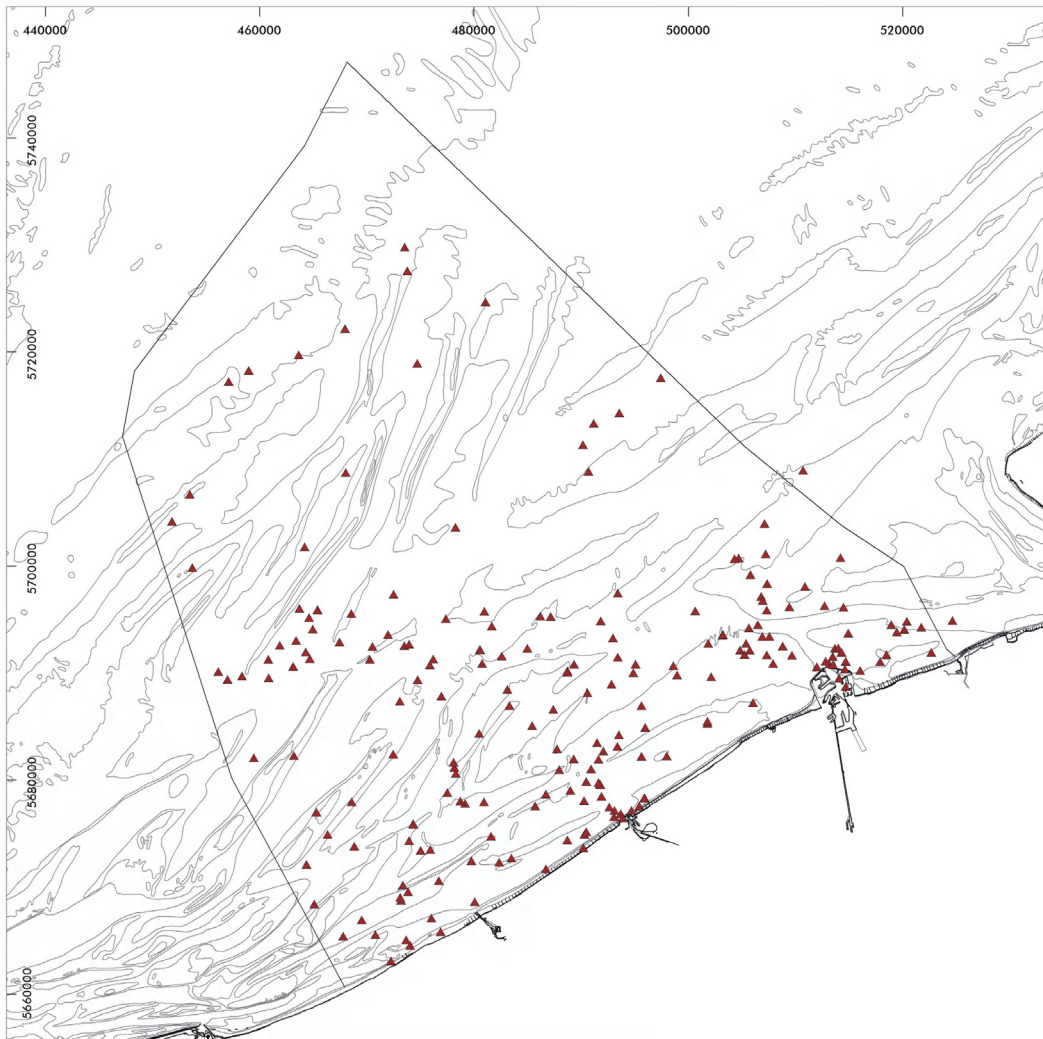
Original data source: Ministry of the Flemish Community, Department of Environment and Infrastructure, Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office

Data analysis: RCMG - Ghent University
Map preparation: RCMG - Ghent University

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Map I.3.1a. Wrecks: spatial distribution



Original data source: Ministry of the Flemish Community, Department of Environment and Infrastructure, Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office, "Wrecks on the Belgian Continental Shelf adapted up to BAZ 2003/07" (3 June 2003)
Map preparation: RCMG - Ghent University

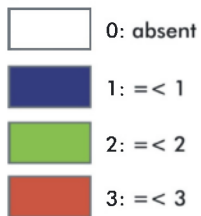
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Map I.3.1b. Wrecks: use intensity



Use intensity of wrecks
(number of wrecks/km²)



0 2.5 5 10 km

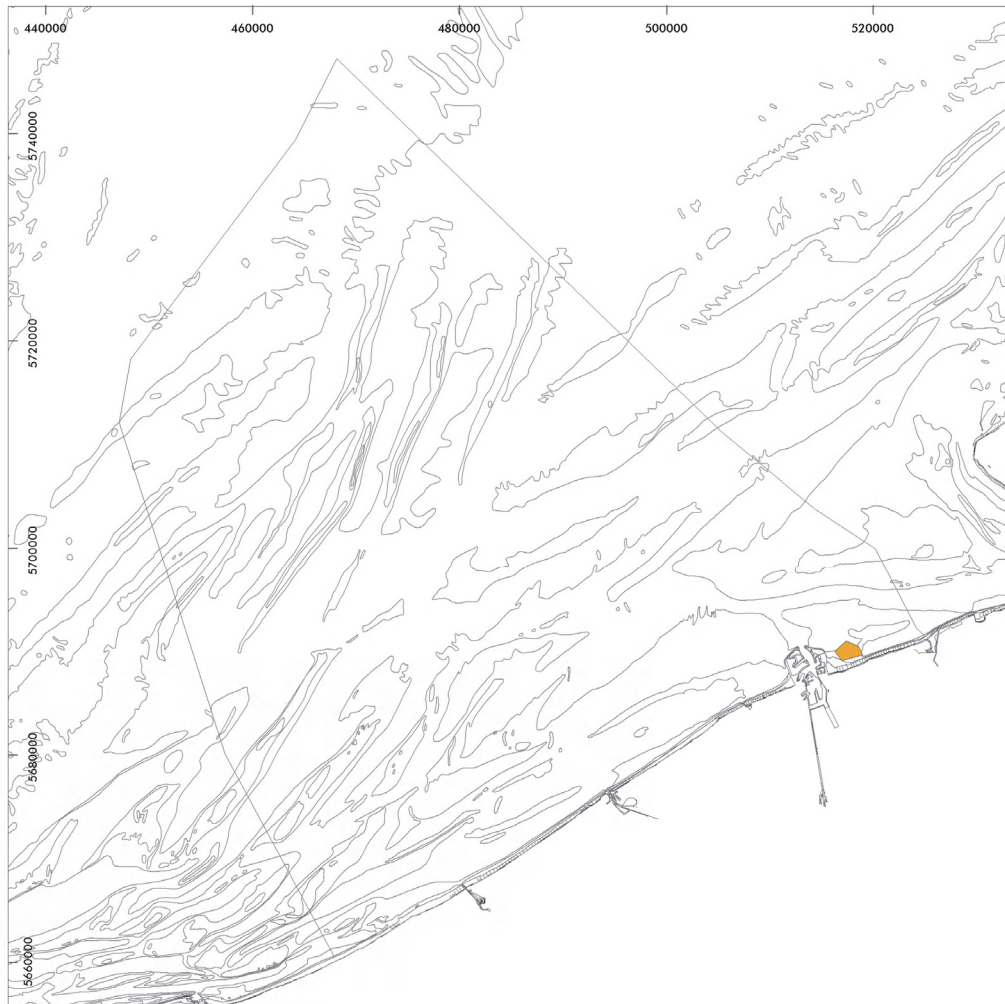
UTM31N - WGS84 coordinates

Original data source: Ministry of the Flemish Community, Department of Environment and Infrastructure, Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office, "Wrecks on the Belgian Continental Shelf adapted up to BAZ 2003/07" (3 June 2003)
Data analysis: Maritime Institute - Ghent University
RCMG - Ghent University
Map preparation: RCMG - Ghent University

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Map I.3.2a. Military ammunition: spatial distribution



 Former war munition
dumping site

 0 2.5 5 10 km

 N

UTM31N - WGS84 coordinates

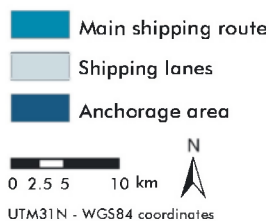
Original data source: Tijdelijke Vereniging Bergingswerken NV,
1989. Magnetometrisch onderzoek op de Paardenmarkt. Intern
rapport, 12 pp.

Ministry of the Flemish Community, Department of Environment
and Infrastructure, Waterways and Marine Affairs
Administration, Division Coast, Hydrographic Office
Map preparation: RCMG - Ghent University

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Map I.3.3a. Shipping and anchorage: spatial distribution

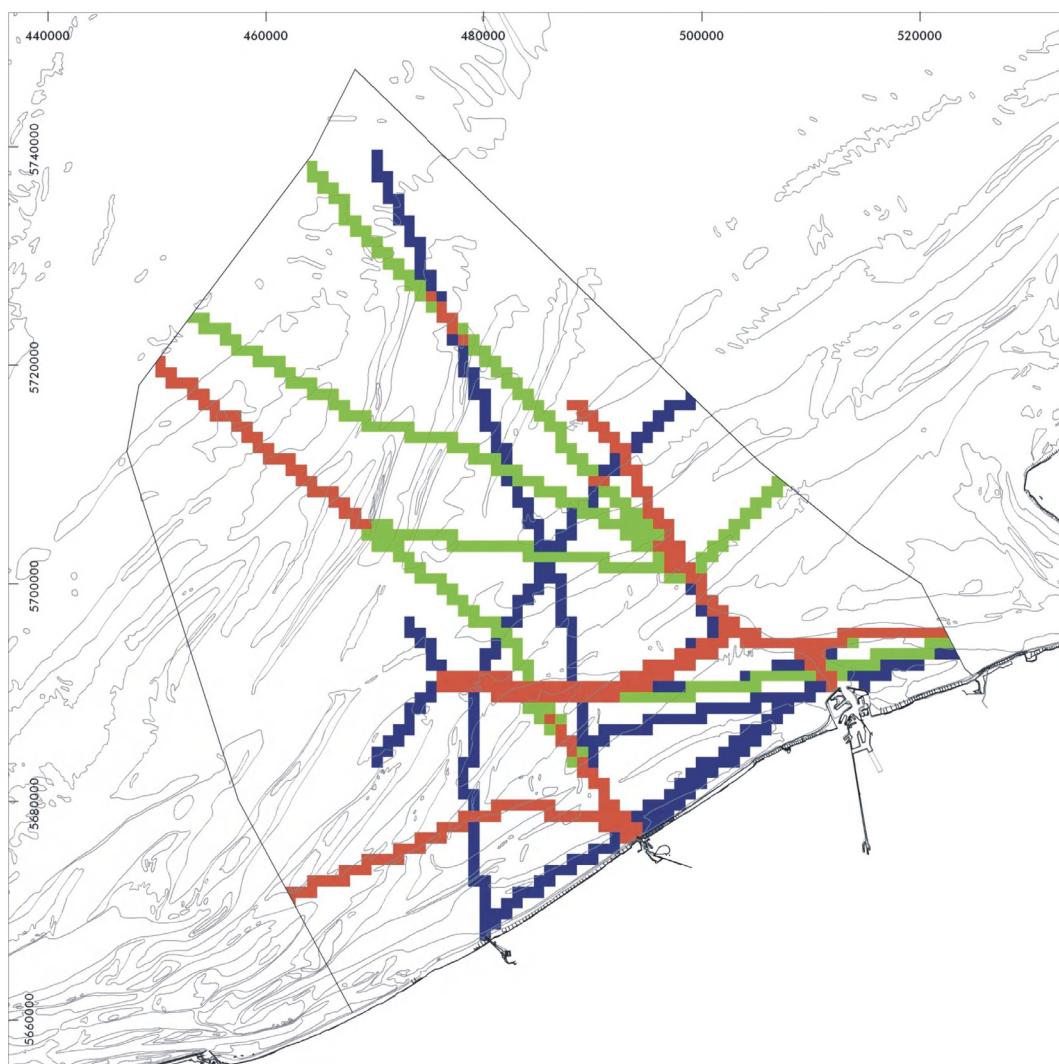


Original data source: International Maritime Organization, Ships' Routeing, London, IMO, 6th Edition, 2003
 IVS-SRK (Ministry of the Flemish Community & Dutch Ministry of Transport, Public Works and Water Management)
 Transeuropa Ferries, Ferryways
 Map preparation: RCMG - Ghent University

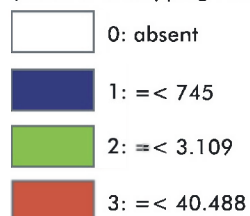
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Map I.3.3b. Shipping: use intensity



Use intensity of shipping traffic
(number of shipping vessels/year/km²)



UTM31N - WGS84 coordinates

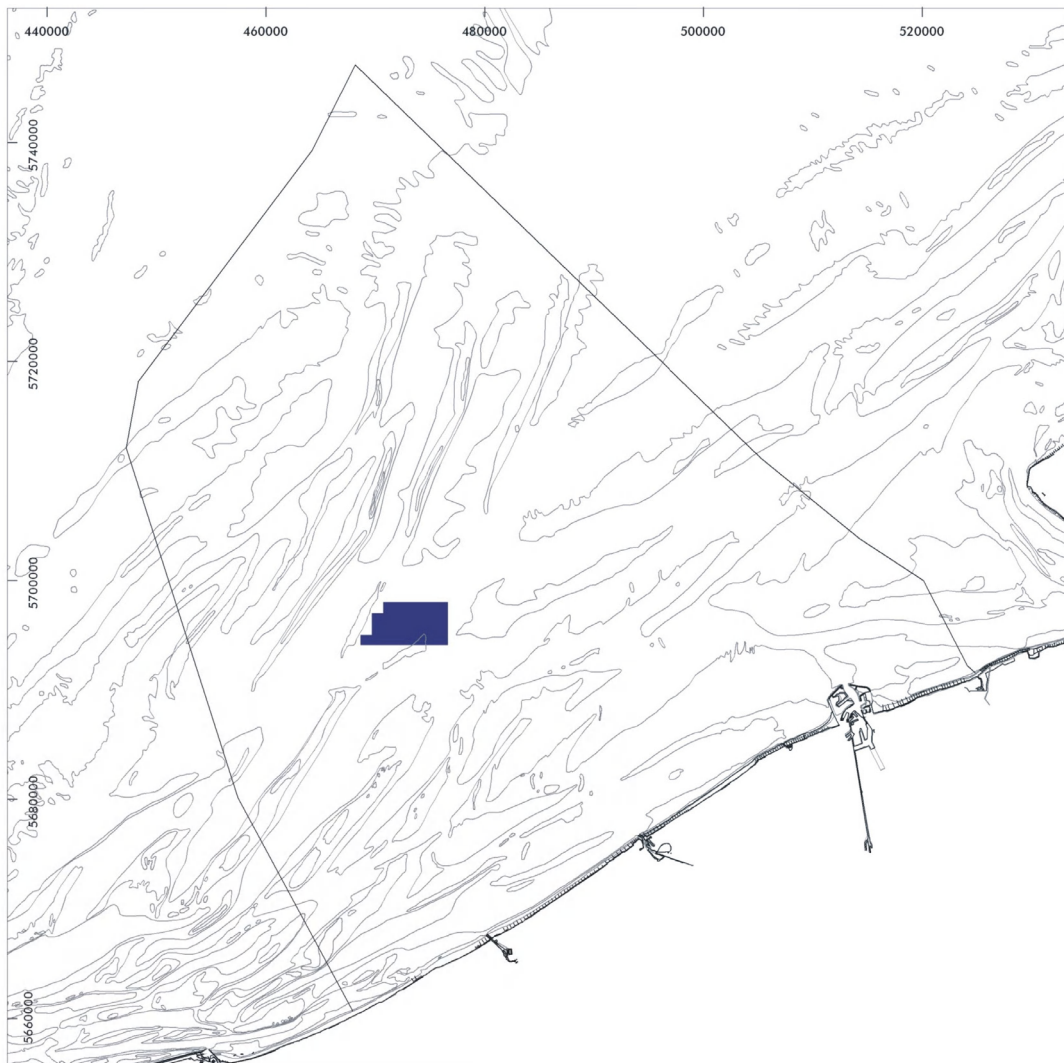
Original data source: IVS-SRK (Ministry of the
Flemish Community & Dutch Ministry of Transport,
Public Works and Water Management)
Transeuropa Ferries, Ferryways
Data analysis: ECOLAS NV
Maritime Institute - Ghent University
Map preparation: RCMG - Ghent University

Shipping data cover merchant shipping from
01 April 2003 - 31 March 2004

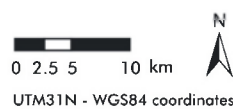
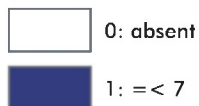
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Map I.3.3c. Anchorage: use intensity



Use intensity of anchorage sites
(average number of vessels/day)



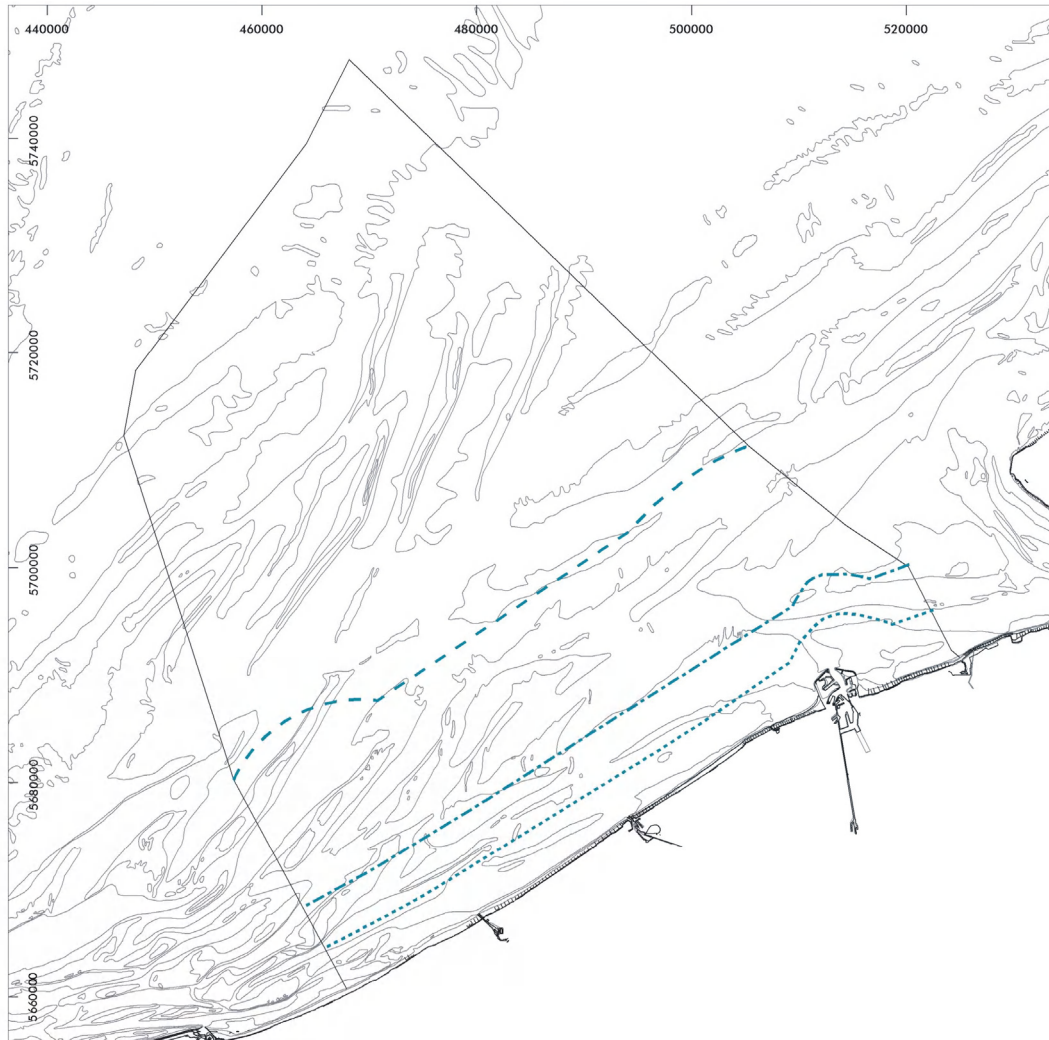
Original data source: IVS-SRK (Ministry of the
Flemish Community & Dutch Ministry of Transport,
Public Works and Water Management)
Data analysis: RCMG - Ghent University
ECOLAS NV
Maritime Institute - Ghent University
Map preparation: RCMG - Ghent University

Data cover anchorage activities from 01 April
2003 - 31 March 2004

May 2005



Map I.3.4a. Fisheries: zonation



..... 3 nautical mile
..... 6 nautical mile
..... 12 nautical mile

0 2.5 5 10 km

UTM31N - WG584 coordinates

Original data source: Ministry of the Flemish Community, Department of Environment and Infrastructure, Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office
Map preparation: RCMG - Ghent University

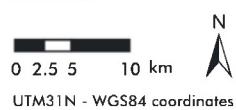
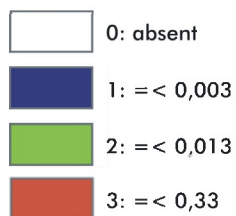
May 2005



Map I.3.4b. Fisheries (fishing): spatial distribution and use intensity



Use intensity of commercial fisheries
(only vessels that are fishing)
(relative number of observed shipping vessels/year/km²)



Original data source: Institute for Nature
Conservation
Data analysis: ECOLAS NV
Map preparation: RCMG - Ghent University

Data cover observed commercial fishery activities
from 30 September 1992 - 25 July 2003

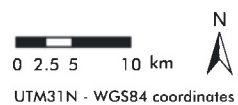
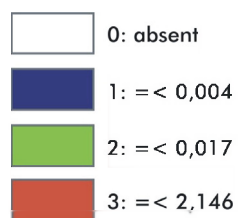
May 2005



Map I.3.4c. Fisheries (fishing and non-fishing): spatial distribution and use intensity



Use intensity of commercial fisheries
(both non-fishing and fishing vessels)
(relative number of observed shipping vessels/year/km²)



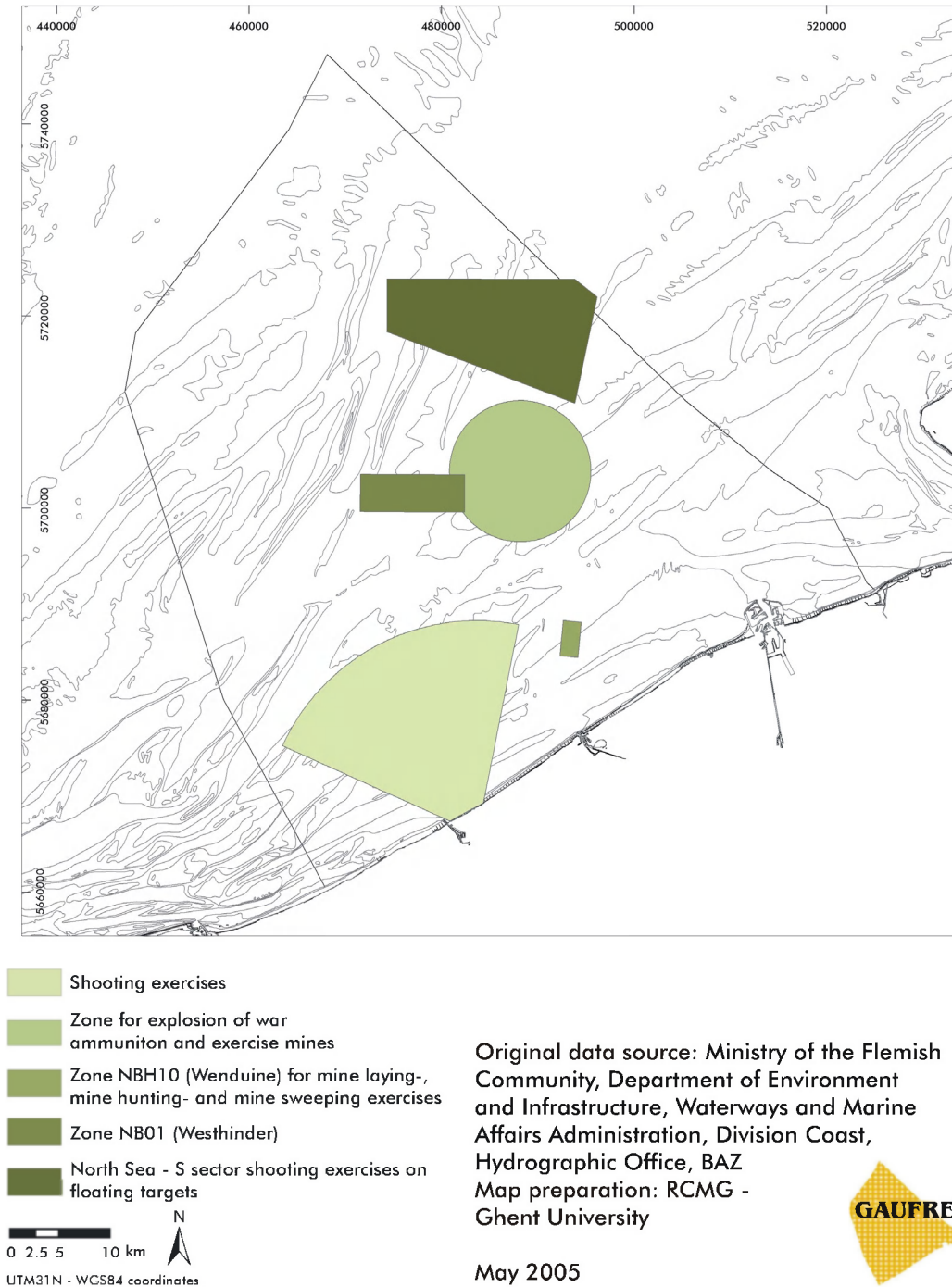
Original data source: Institute for Nature
Conservation
Data analysis: ECOLAS NV
Map preparation: RCMG - Ghent University

Data cover observed commercial fishery activities
from 30 September 1992 - 25 July 2003

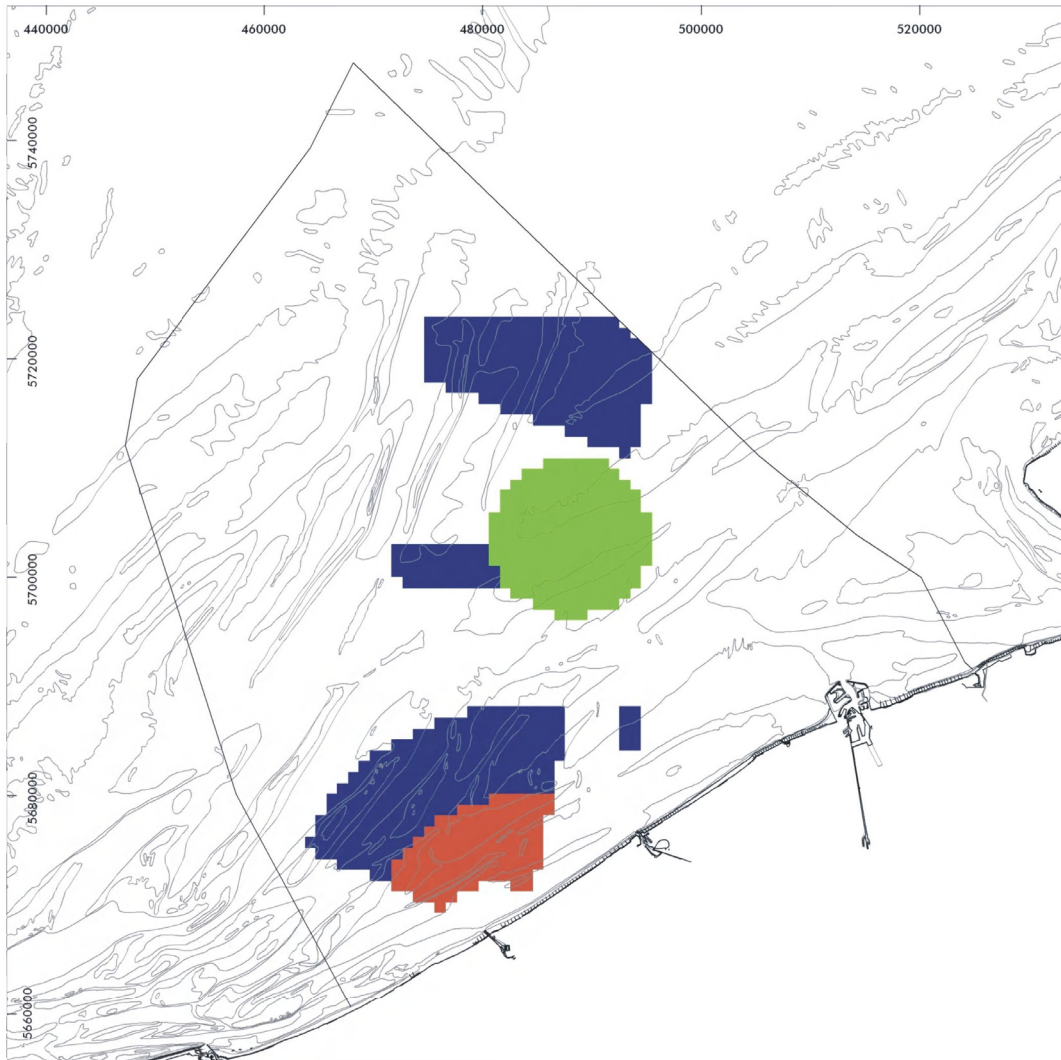
May 2005



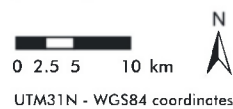
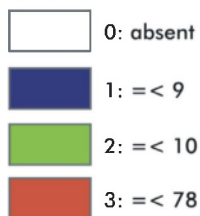
Map I.3.5a. Military exercises: spatial distribution



Map I.3.5b. Military exercises: use intensity



Use intensity of military exercises
(number of exercise days/year/km²)



Original data source: spokesmen of the Army, Air Force and Navy Components, Federal Government Department of Defence
Data analysis: Marine Biology Section - Ghent University
RCMG - Ghent University
Map preparation: RCMG - Ghent University

Data cover military exercises from 01 January 2001 - 31 December 2001

May 2005



Map I.3.6a. Sand and gravel extraction: spatial distribution



- Control zones sand extraction
- Exploration zone
- Past concession zones

0 2.5 5 10 km

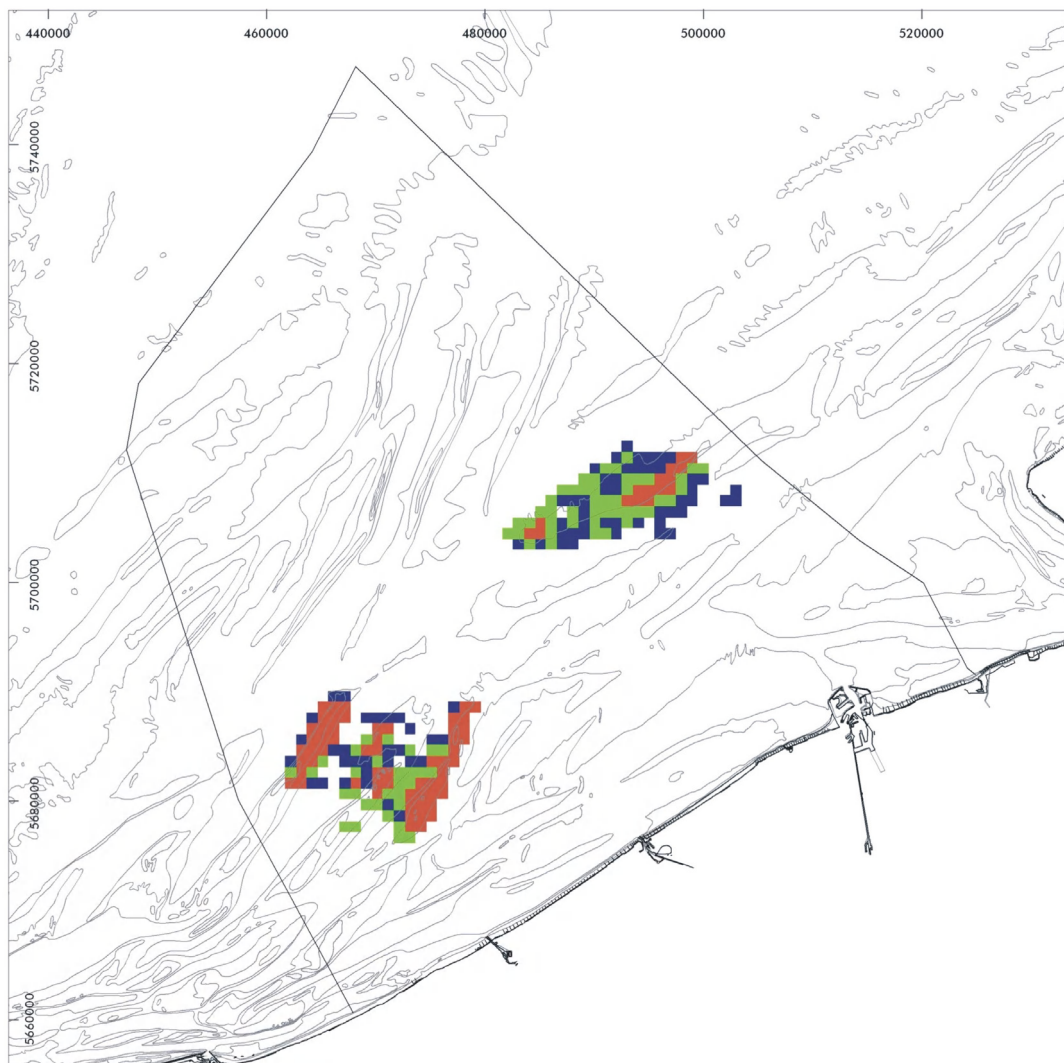
UTM31N - WGS84 coordinates

Original data source: Federal Public Service
Economy, SMEs, Self-employed and Energy
Ministry of the Flemish Community, Department
of Environment and Infrastructure, Waterways
and Marine Affairs Administration, Division
Coast, Hydrographic Office
Map preparation: RCMG - Ghent University

May 2005



Map I.3.6b. Sand and gravel extraction: use intensity



Use intensity of sand extraction
(number of min/km²)



0 2.5 5 10 km
UTM31N - WGS84 coordinates

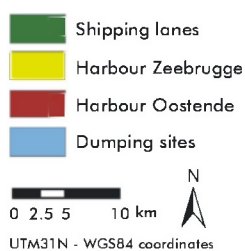
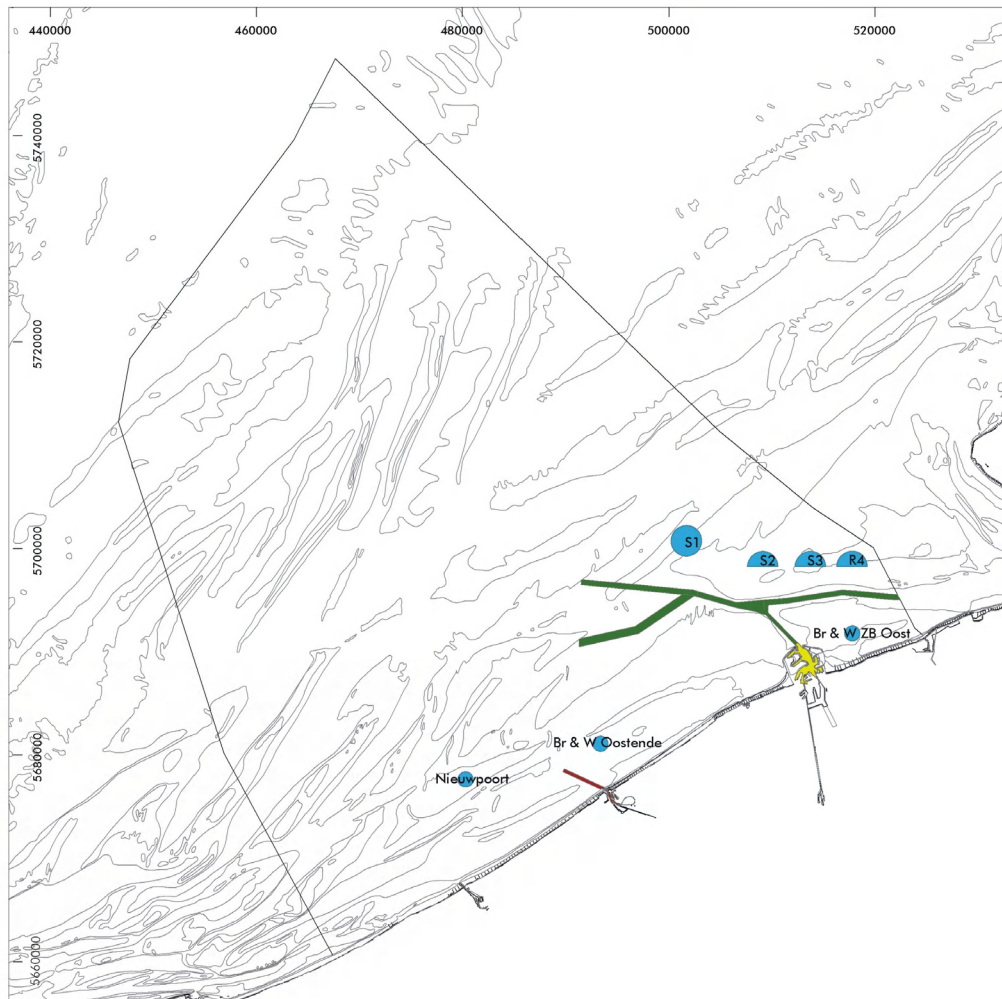
Original data source: ZAGRI database
Federal Public Service Economy, SMEs,
Self-employed and Energy
Ministry of the Flemish Community, Department of
Environment and Infrastructure, Waterways and
Marine Affairs Administration: Division Coast -
Hydrographic Office
Data analysis: RCMG - Ghent University
Map preparation: RCMG - Ghent University

Data cover sand extraction activities from
01 June 2002 - 31 December 2003

May 2005



Map I.3.7a. Dredging and disposal of dredged material: spatial distribution

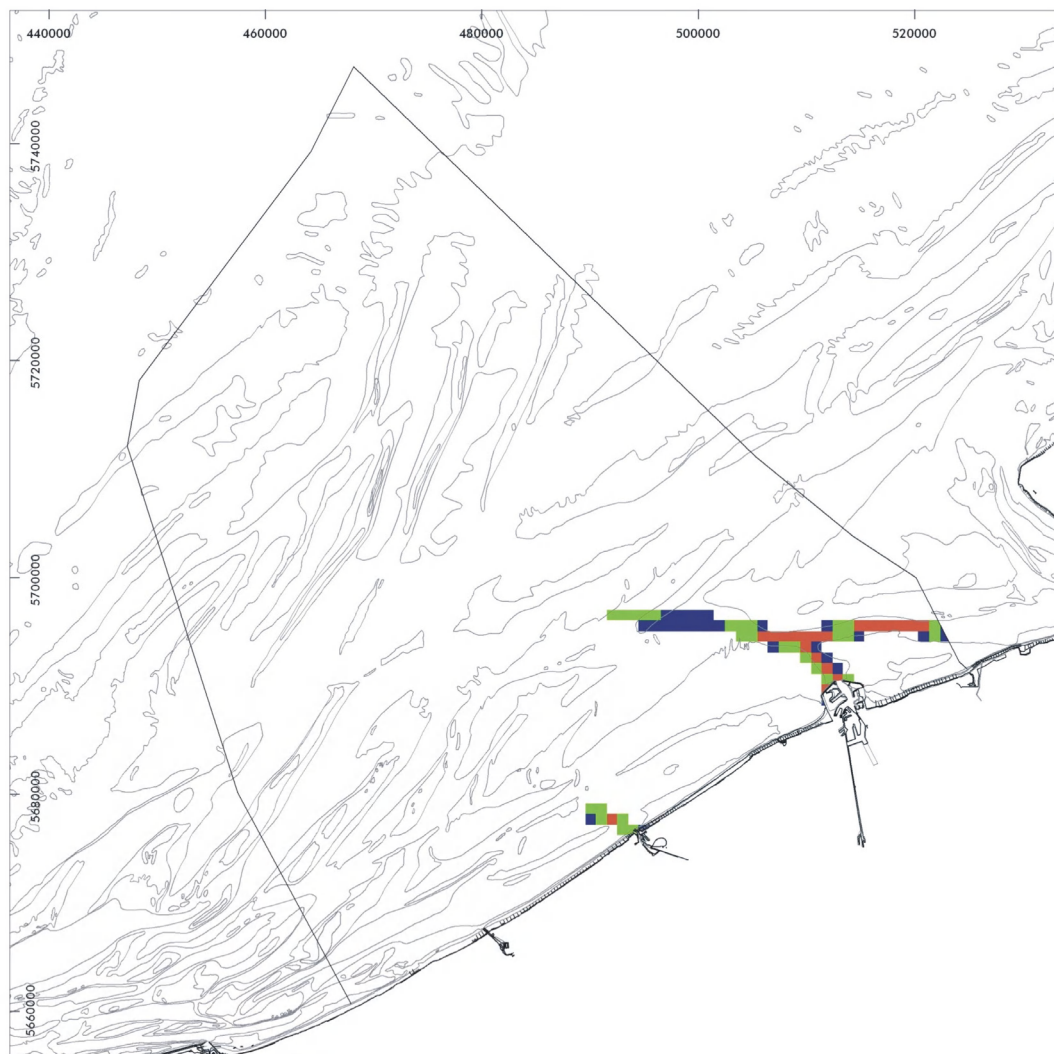


Original data source: Ministry of the Flemish Community, Department of Environment and Infrastructure, Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office & Maritime Entrance Division
Map preparation: RCMG - Ghent University

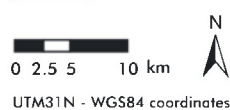
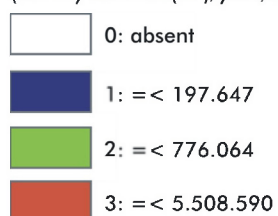
May 2005



Map I.3.7b. Dredging: use intensity



Use intensity of dredging
(ton dry material(m^3)/year/ km^2)



Original data source: Ministry of the Flemish
Community, Department of Environment and
Infrastructure, Waterways and Marine Affairs
Administration, Division Coast, Hydrographic
Office & Maritime Entrance Division
GEMS International N.V.
Data analysis: RCMG - Ghent University
Map preparation: RCMG - Ghent University

Data cover dredging activities from 01 April
1998 - 31 March 2003

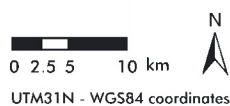
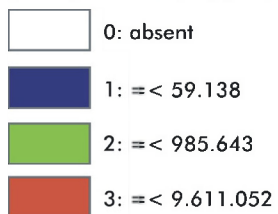
May 2005



Map I.3.7c. Disposal of dredged material: use intensity



Use intensity of disposal of dredged material
(ton dry material (m³)/year/km²)



Original data source: Ministry of the Flemish Community,
Department of Environment and Infrastructure, Waterways
and Marine Affairs Administration: Division Coast, Hydrographic
Office & Maritime Entrance Division
GEMS International N.V.
Data analysis: RCMG - Ghent University
Map preparation: RCMG - Ghent University

Data cover disposal activities from 01 April 1998 -
31 March 2003

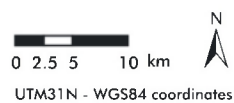
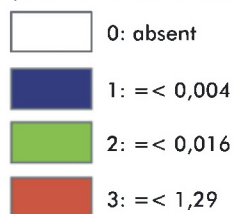
May 2005



Map I.3.9a. Recreation and tourism at sea (recreational fisheries): spatial distribution and use intensity



Use intensity of recreational fishing at sea
(relative number of observed recreational fishing vessels/year/km²)



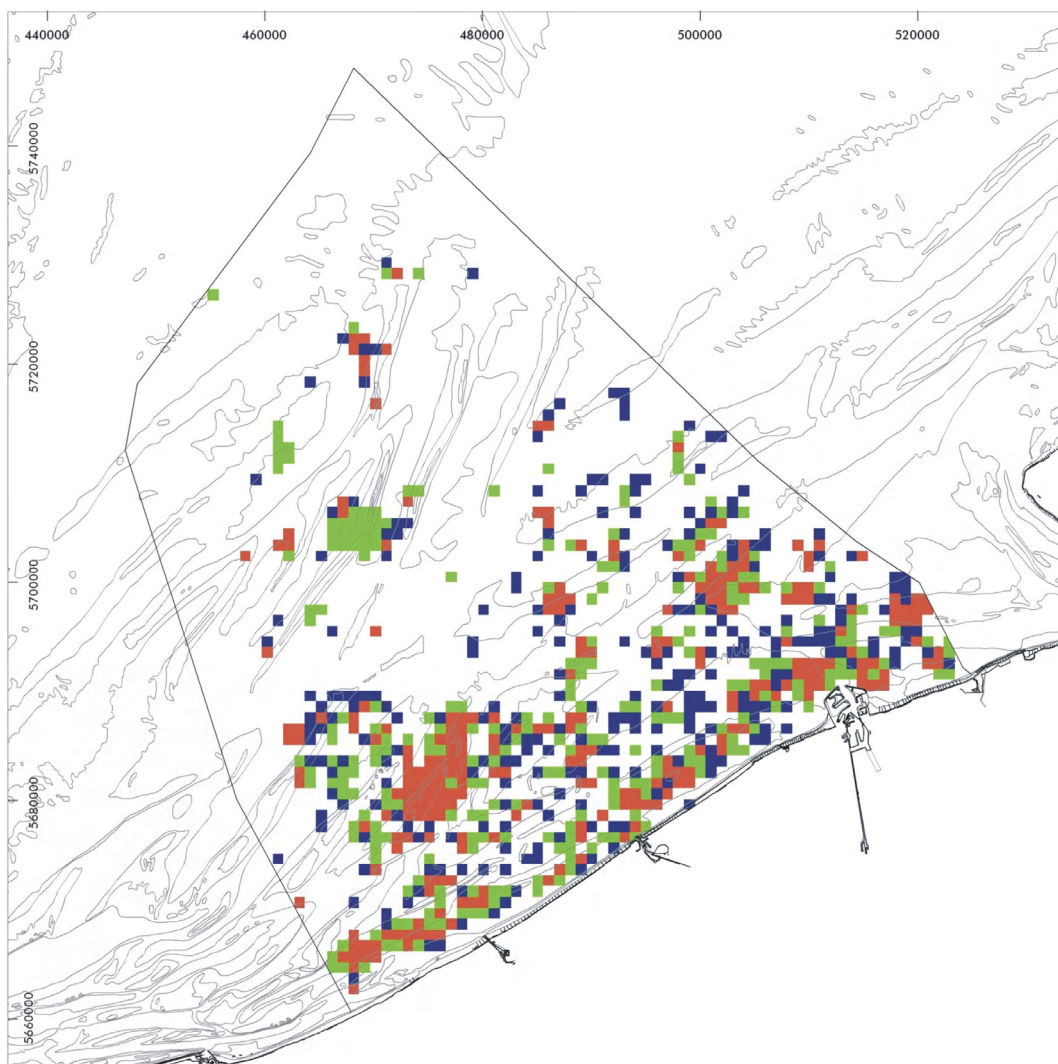
Original data source: Institute for Nature Conservation
Data analysis: ECOLAS NV
Map preparation: RCMG - Ghent University

Data cover observed commercial fishery activities
from 30 September 1992 - 25 July 2003

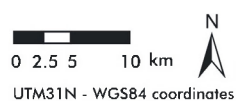
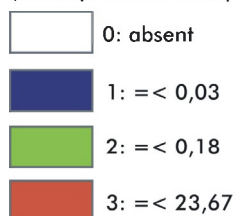
May 2005



Map I.3.11a. Scientific research (slow): spatial distribution and use intensity



Use intensity of research (speed over ground ≤ 1 knot
(mean presence time/years(hours)/km²))



Original data source: Flanders Marine Institute
Management Unit of the North Sea Mathematical
Models

Data analysis: ECOLAS NV

Map preparation: RCMG - Ghent University

Data cover research activities from 01
January 2002 - 31 December 2003

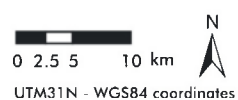
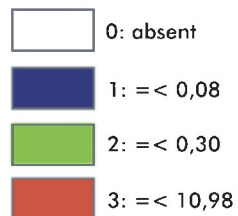
May 2005



Map I.3.11b. Scientific research (fast): spatial distribution and use intensity



Use intensity of research (speed over ground > 1 knot
(mean presence time/years(hours)/km²)



Original data source: Flanders Marine Institute
Management Unit of the North Sea Mathematical
Models
Data analysis: ECOLAS NV
Map preparation: RCMG - Ghent University



Data cover research activities from 01
January 2002 - 31 December 2003

May 2005



Map I.3.12a. Nature conservation: spatial distribution



 Ramsar area
 Trapegeer - Stroombank area

0 2.5 5 10 km

UTM31N - WGS84 coordinates

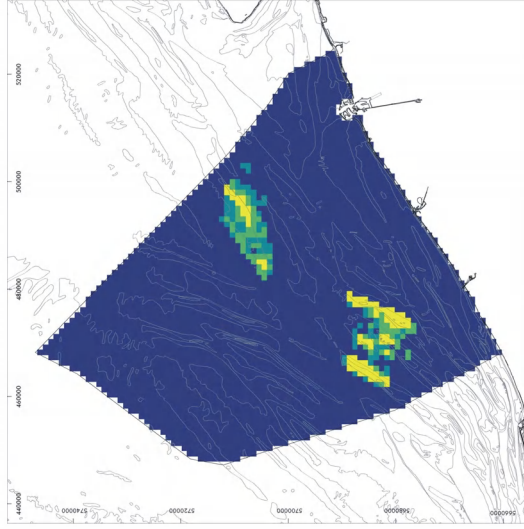
Original data source: Haelters et al. (2004).
Ornitologisch belang van de Belgische zee-
gebieden. Bulletin van het Koninklijk Belgisch
Instituut voor Natuurwetenschappen, Biologie,
vol. 74 (suppl.).
Map preparation: RCMG - Ghent University

May 2005

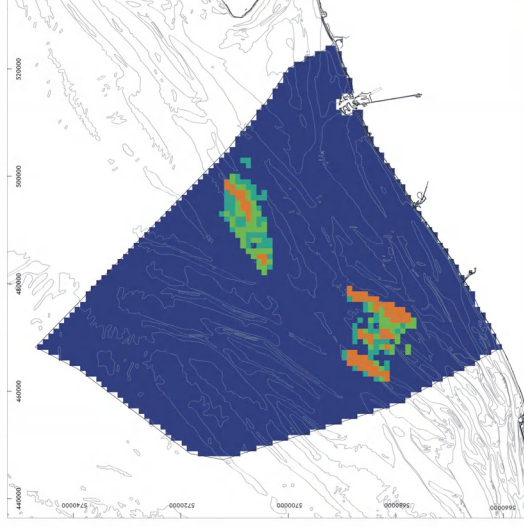


Impact maps - Sand extraction

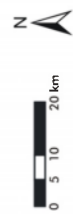
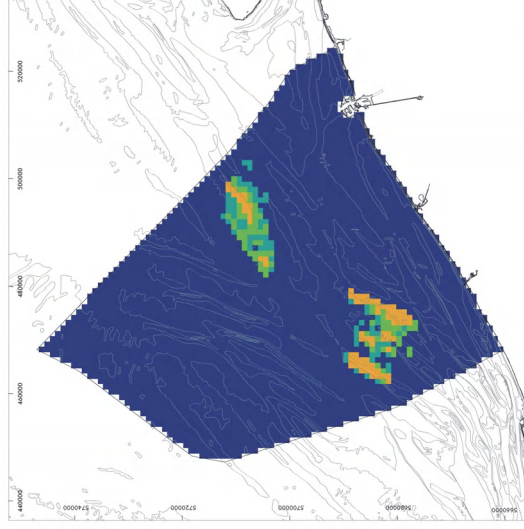
Chemical impact



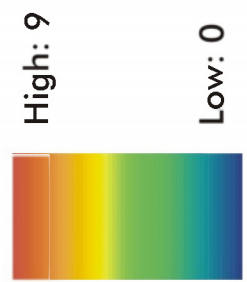
Ecological impact



Physical impact



Relative impact value



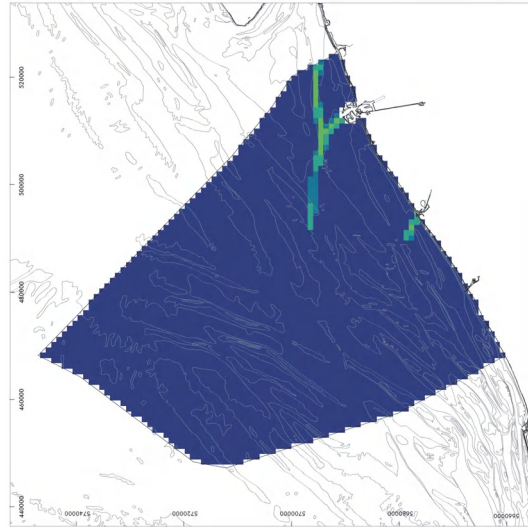
Original data source: Federal Public Service Economy, SMEs, Self-employed and Energy
Ministry of the Flemish Community, Department of Environment and Infrastructure,
Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office
Impact analysis: ECOLAS NV
Map preparation: RCMG - Ghent University

Data cover sand extraction activities from 01 June 2002 - 31 December 2003
May 2005

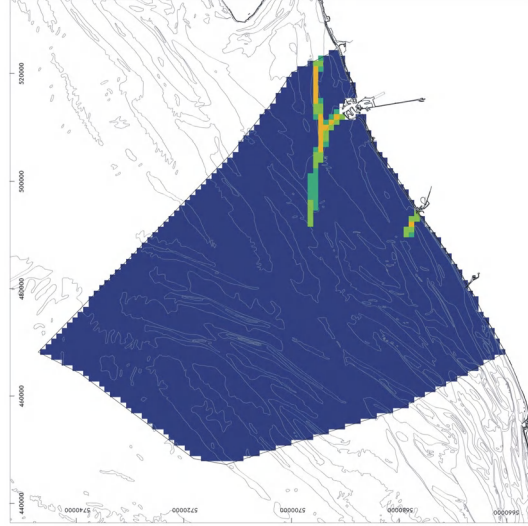


Impact maps - Dredging

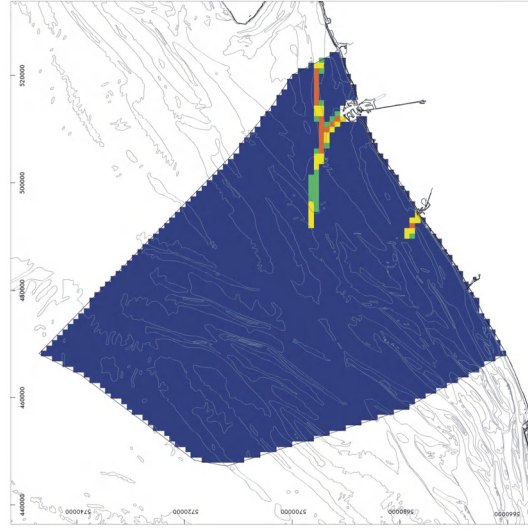
Chemical impact



Ecological impact



Physical impact



Relative impact value



High: 9

Low: 0

Original data source: Ministry of the Flemish Community, Department of Environment and Infrastructure, Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office & Maritime Entrance Division
GEMS International N.V.
Impact analysis: ECOLAS NV
Map preparation: RCMG - Ghent University

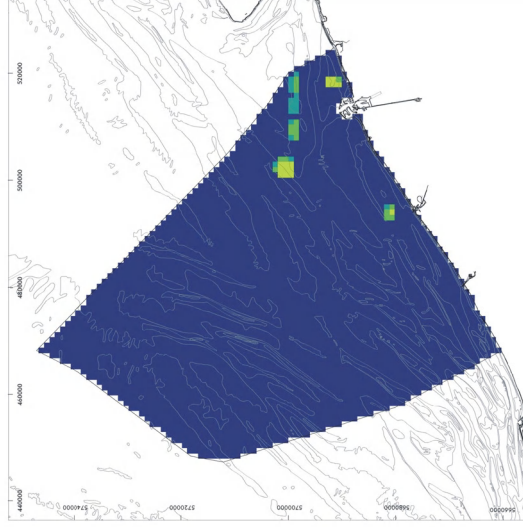
Data cover dredging activities from 01 April 1998 - 31 March 2003

May 2005

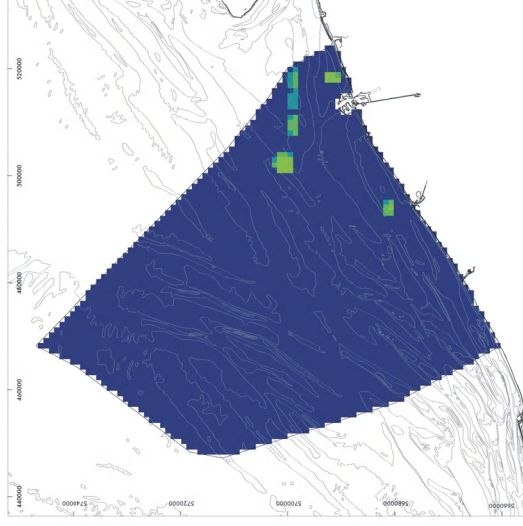


Impact maps - Disposal of dredged material

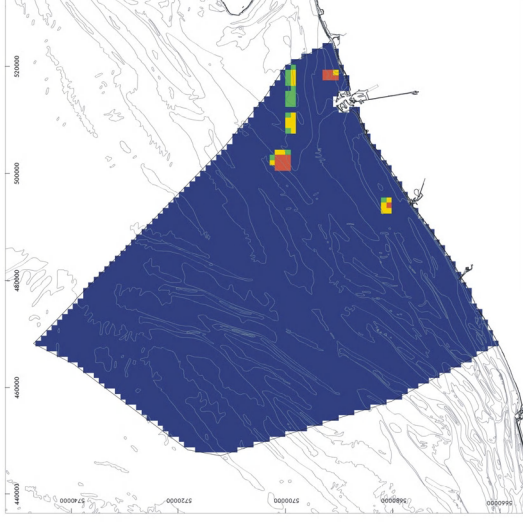
Chemical impact



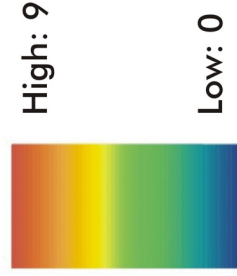
Ecological impact



Physical impact



Relative impact value



Original data source: Ministry of the Flemish Community, Department of Environment and Infrastructure, Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office & Maritime Entrance Division
GEMS International N.V.
Impact analysis: ECOLAS NV
Map preparation: RCMG - Ghent University

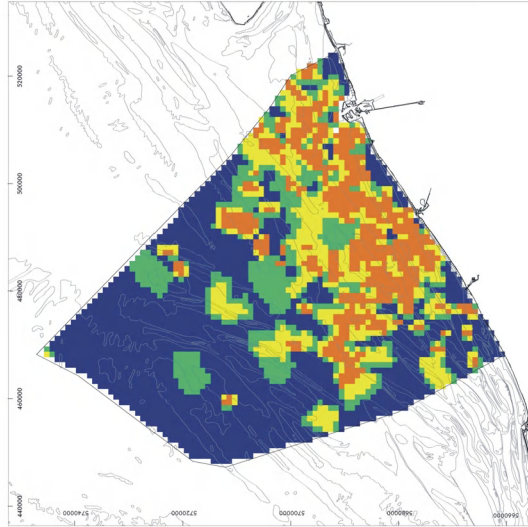
Data cover disposal activities from 01 April 1998 - 31 March 2003

May 2005

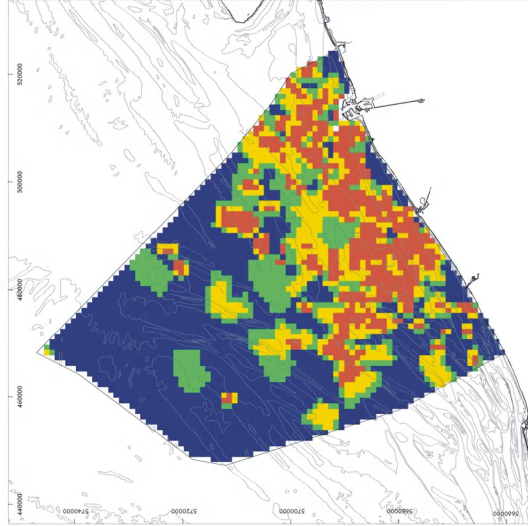


Impact maps - Commercial fisheries

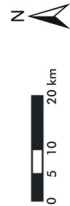
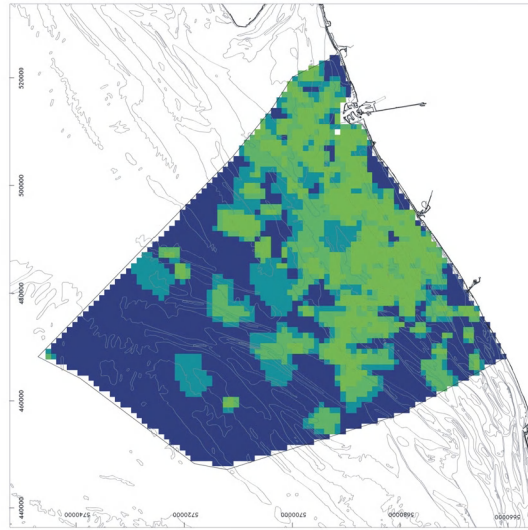
Chemical impact



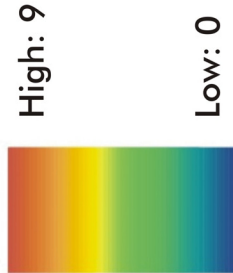
Ecological impact



Physical impact



Relative impact value



Original data source: Institute for Nature Conservation
Impact analysis: ECOLAS NV
Map preparation: RCMG - Ghent University

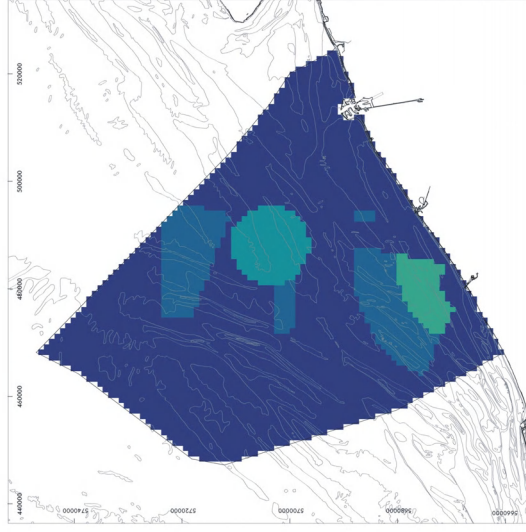
Data cover observed commercial fishery activities from 30 September 1992 - 25 July 2003

May 2005

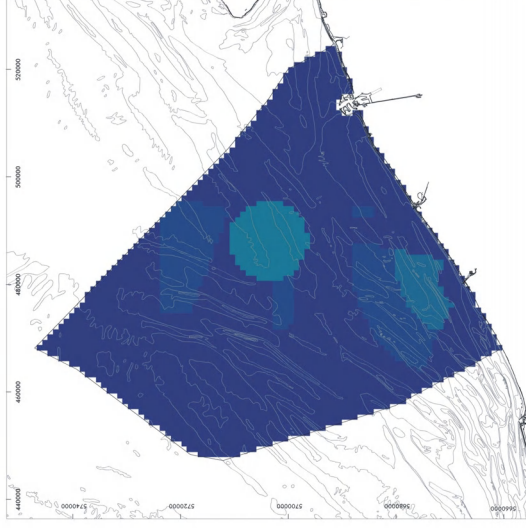


Impact maps - Military exercises

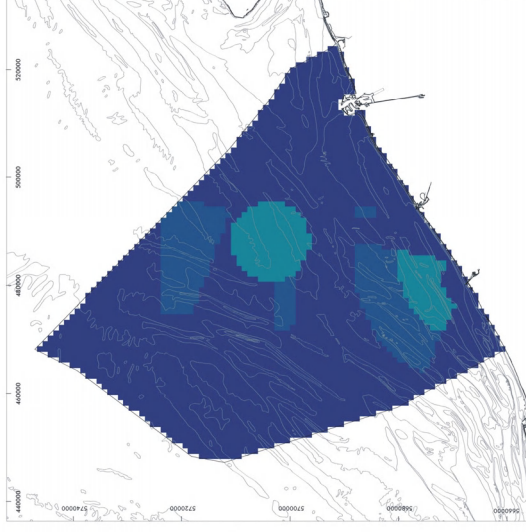
Chemical impact



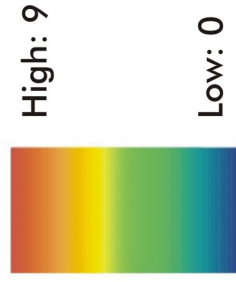
Ecological impact



Physical impact



Relative impact value



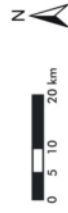
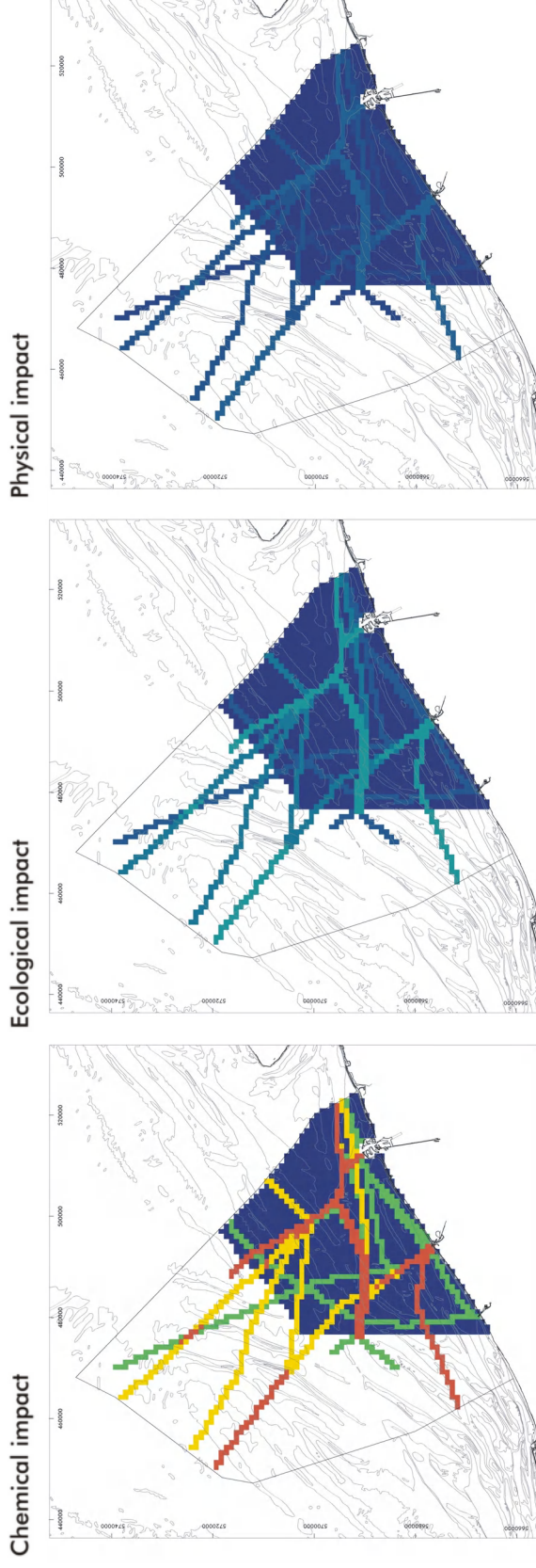
Original data source: spokesmen of the Army, Air Force and Navy
Components, Federal Government Department of Defence
Impact analysis: ECOLAS NV
Map preparation: RCMG - Ghent University

Data cover military exercises from 01 January 2001 - 31 December 2001

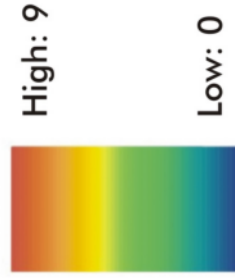
May 2005



Impact maps - Shipping



Relative impact value

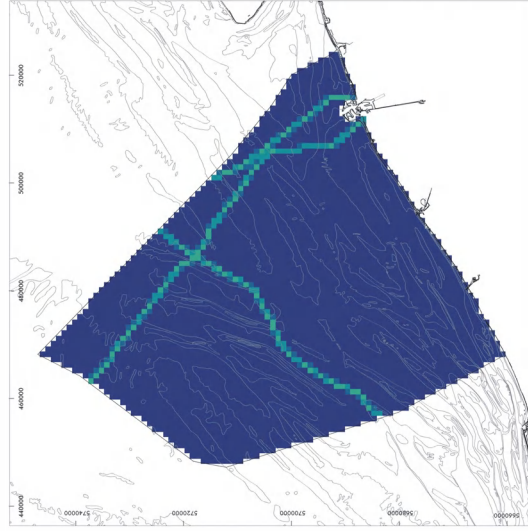


Original data source: IVS-SRK (Ministry of the Flemish Community & Dutch
Ministry of Transport, Public Works and Water Management)
Transeuropa Ferries, Ferryways
Impact analysis: ECOLAS NV
Map preparation: RCMG - Ghent University

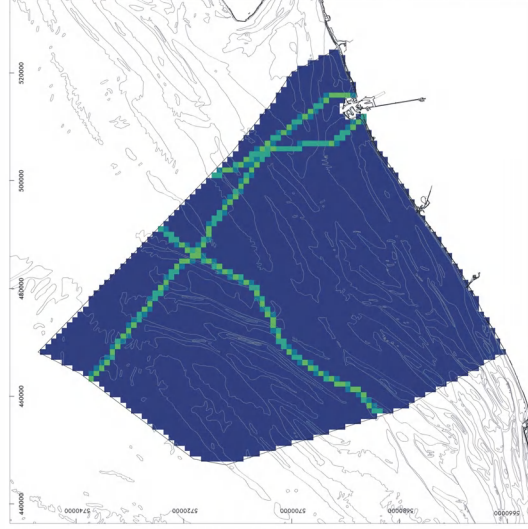
Shipping data cover merchant shipping from 01 April 2003 - 31 March 2004
May 2005

Impact maps - Pipeline construction

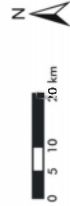
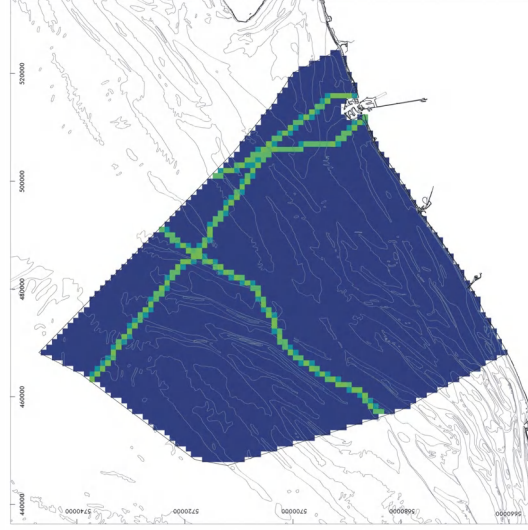
Chemical impact



Ecological impact



Physical impact



Relative impact value

High: 9



Low: 0

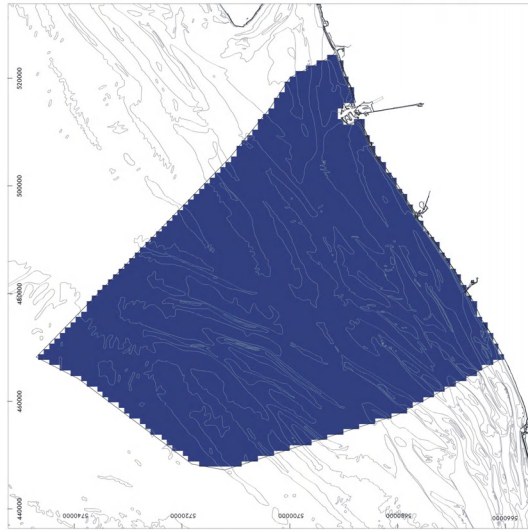


Original data source: Federal Public Service Economy, SMEs, Self-employed and Energy
Ministry of the Flemish Community, Department of Environment and Infrastructure,
Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office
Impact analysis: ECOLAS NV
Map preparation: RCMG - Ghent University

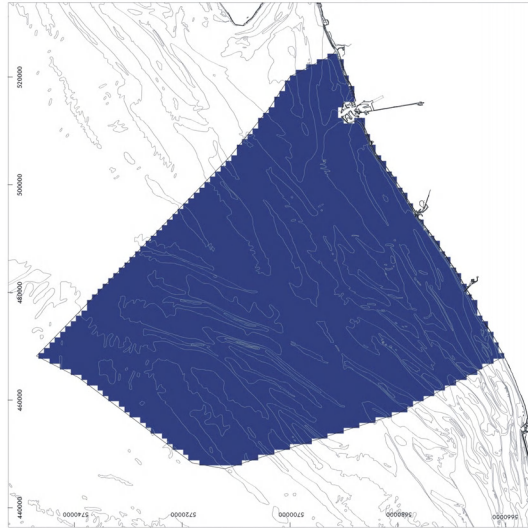
May 2005

Impact maps - Pipeline exploitation

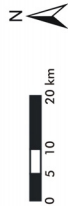
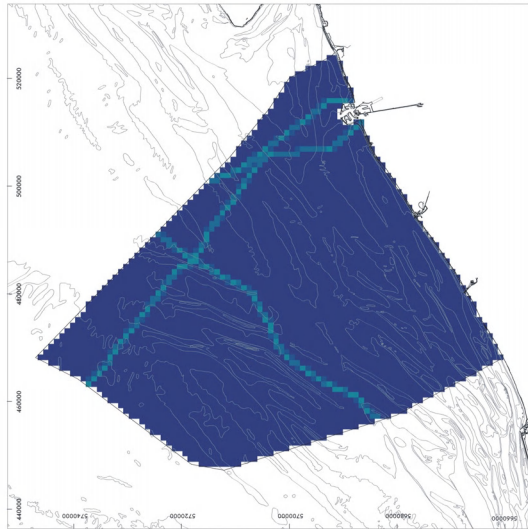
Chemical impact



Ecological impact



Physical impact



Relative impact value



High: 9

Low: 0

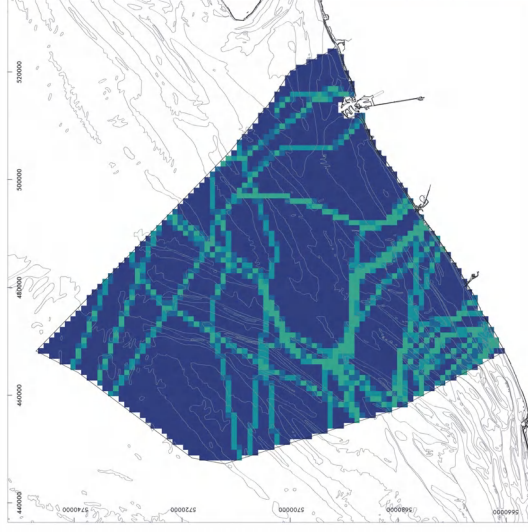


Original data source: Federal Public Service Economy, SMEs, Self-employed and Energy
Ministry of the Flemish Community, Department of Environment and Infrastructure,
Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office
Impact analysis: ECOLAS NV
Map preparation: RCMG - Ghent University

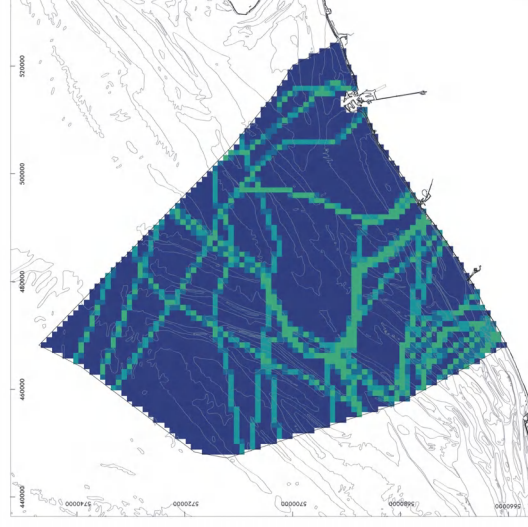
May 2005

Impact maps - Electricity and telecom cable construction

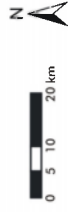
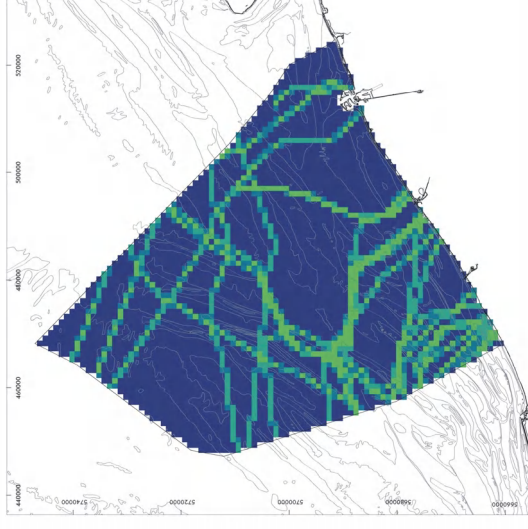
Chemical impact



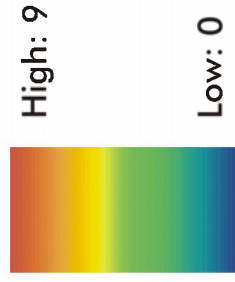
Ecological impact



Physical impact



Relative impact value

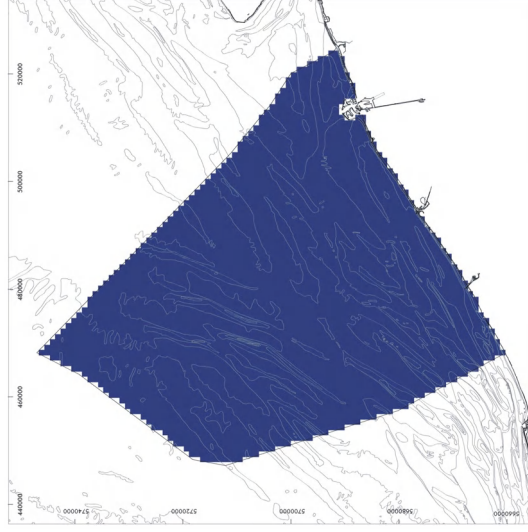


Original data source: Federal Public Service Economy, SMEs, Self-employed and Energy
Ministry of the Flemish Community, Department of Environment and Infrastructure,
Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office
C-power NV
TV Electrabel - Ondernemingen Jan De Nul (Project Seanergy)
Impact analysis: ECOLAS NV
Map preparation: RCMG - Ghent University
May 2005

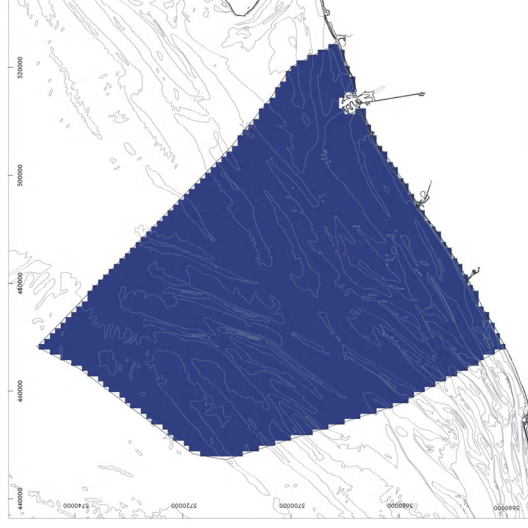


Impact maps - Electricity and telecom cable exploitation

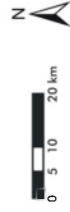
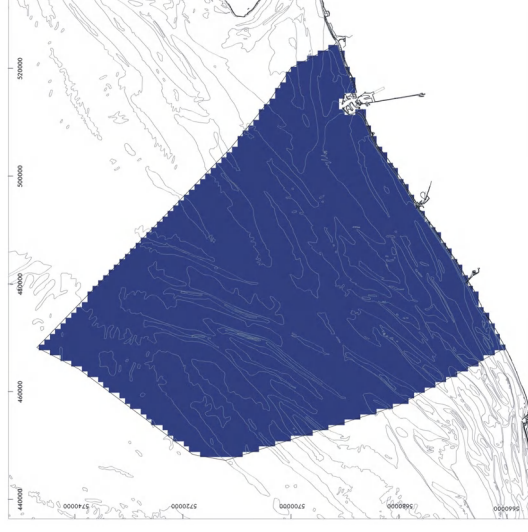
Chemical impact



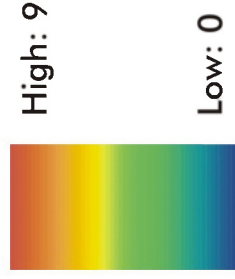
Ecological impact



Physical impact



Relative impact value

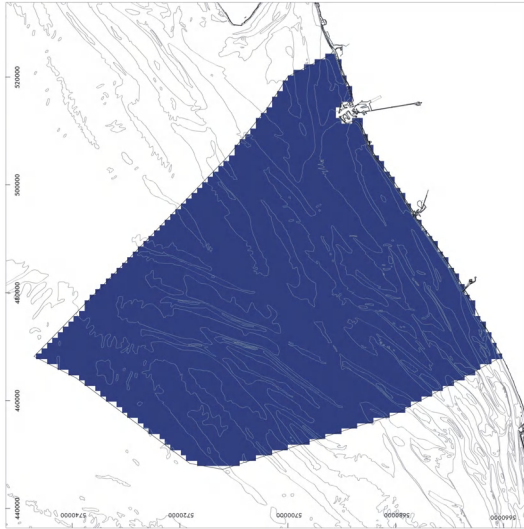


Original data source: Federal Public Service Economy, SMEs, Self-employed and Energy
Ministry of the Flemish Community, Department of Environment and Infrastructure,
Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office
C-power NV
TV 'Electrabel - Ondernemingen Jan De Nul (Project Seanergy)
Impact analysis: ECOLAS NV
Map preparation: RCMG - Ghent University
May 2005

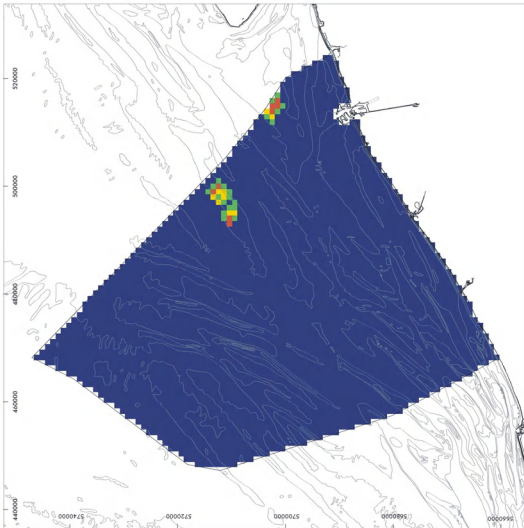


Impact maps - Wind turbine construction

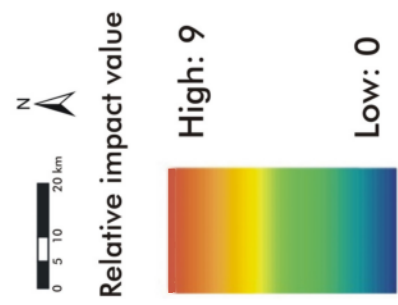
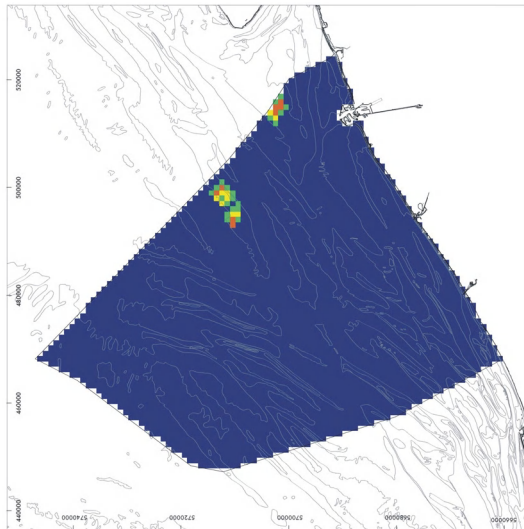
Chemical impact



Ecological impact



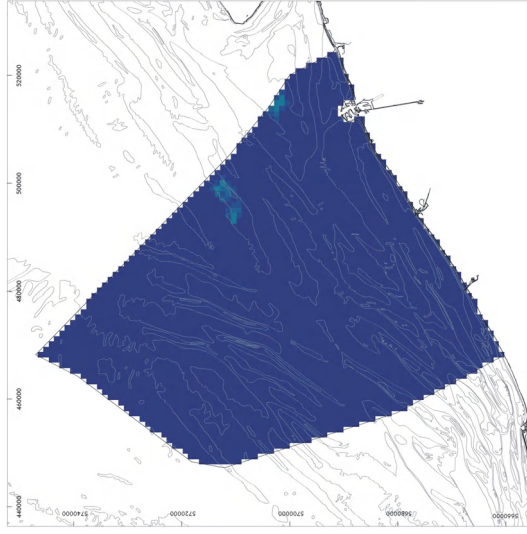
Physical impact



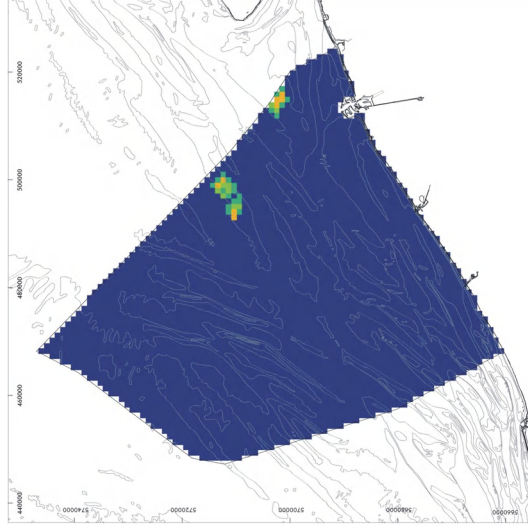
Original data source: C-power NV
TV Electrabel - Ondernemingen Jan De Nul (Project Seanergy)
Impact analysis: ECOLAS NV
Map preparation: RCMG - Ghent University
May 2005

Impact maps - Wind turbine exploitation

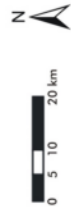
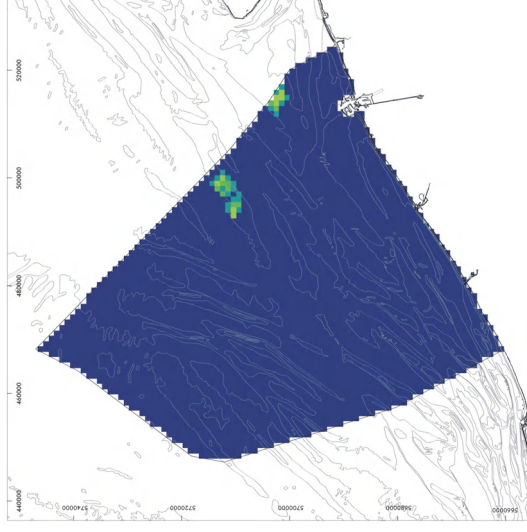
Chemical impact



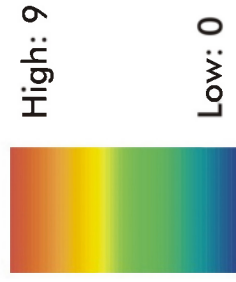
Ecological impact



Physical impact



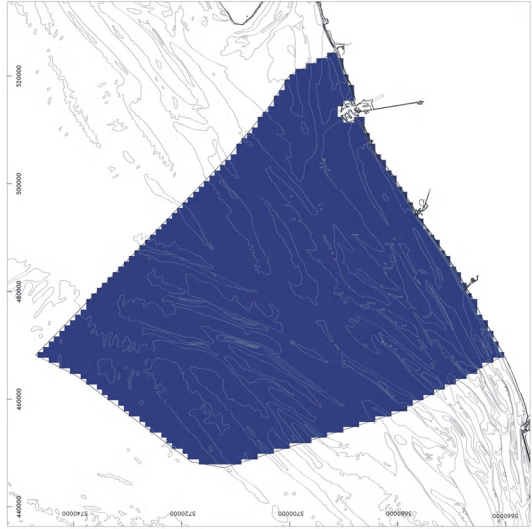
Relative impact value



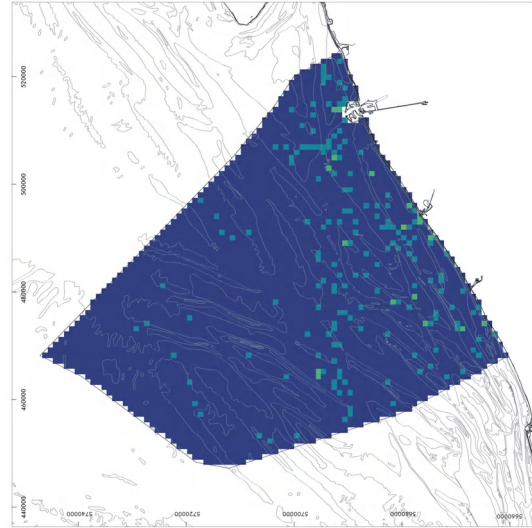
Original data source: C-power NV
TV Electrabel - Ondernemingen Jan De Nul (Project Seenergy)
Impact analysis: ECOLAS NV
Map preparation: RCMG - Ghent University
May 2005

Impact maps - Wrecks

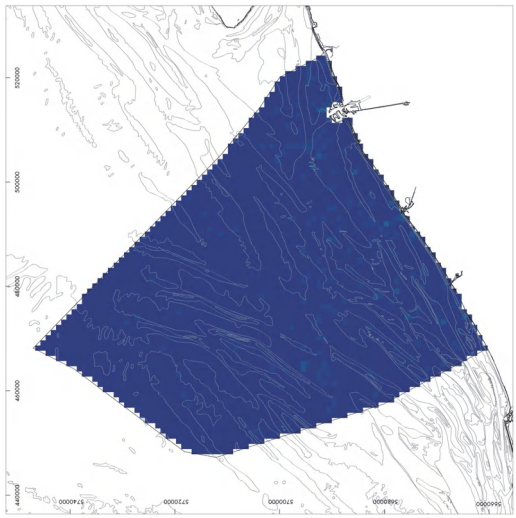
Chemical impact



Ecological impact



Physical impact



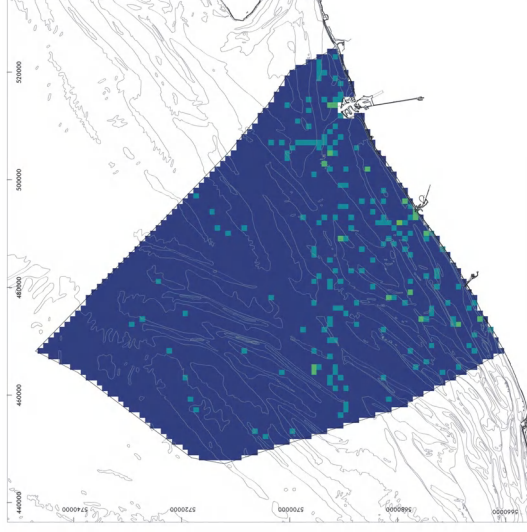
Relative impact value



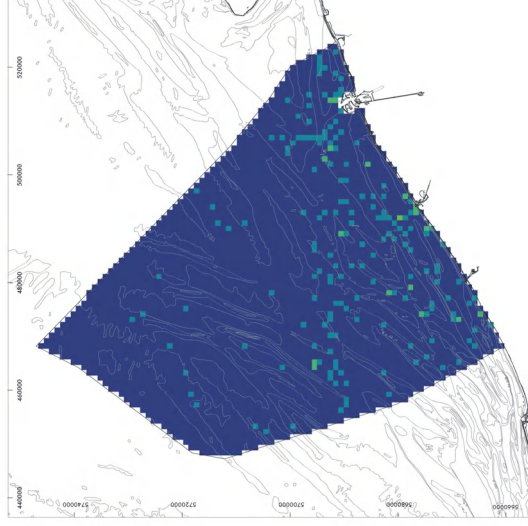
Original data source: Ministry of the Flemish Community, Department of Environment and Infrastructure, Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office, "Wrecks on the Belgian Continental Shelf adapted up to BAZ 2003/07" (3 June 2003)
Impact analysis: ECOLAS NV
Map preparation: RCMG - Ghent University
May 2005

Impact maps - Wreck salvage

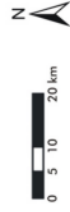
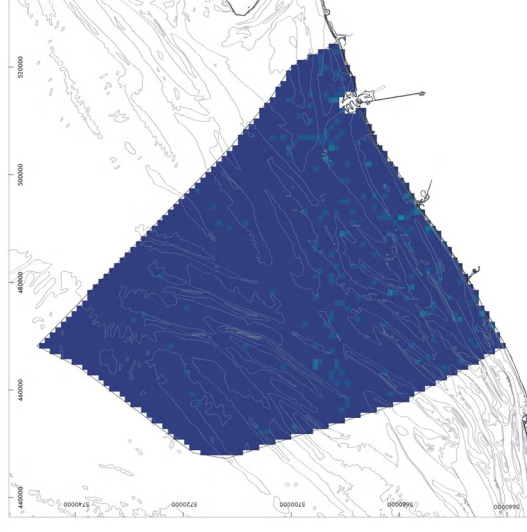
Chemical impact



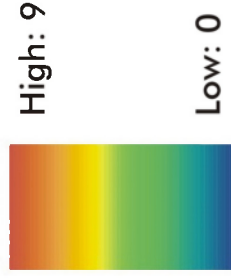
Ecological impact



Physical impact



Relative impact value



Original data source: Ministry of the Flemish Community, Department of Environment and Infrastructure, Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office, "Wrecks on the Belgian Continental Shelf adapted up to BAZ 2003/07" (3 June 2003)

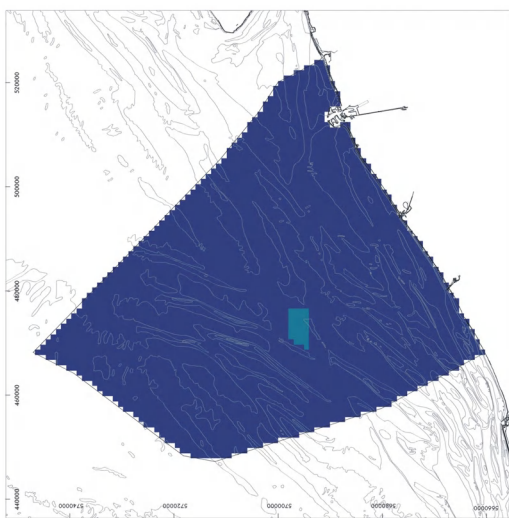
Impact analysis: ECOLAS NV

Map preparation: RCMG - Ghent University

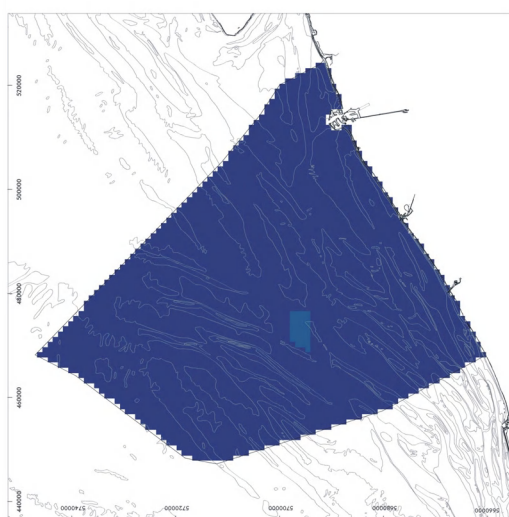
May 2005

Impact maps - Anchorage area

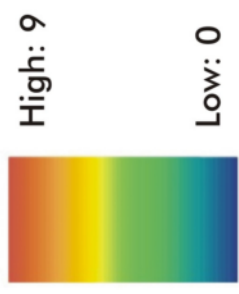
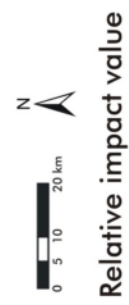
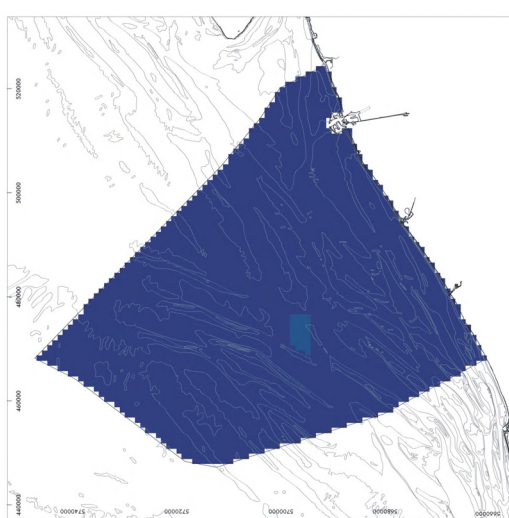
Chemical impact



Ecological impact



Physical impact



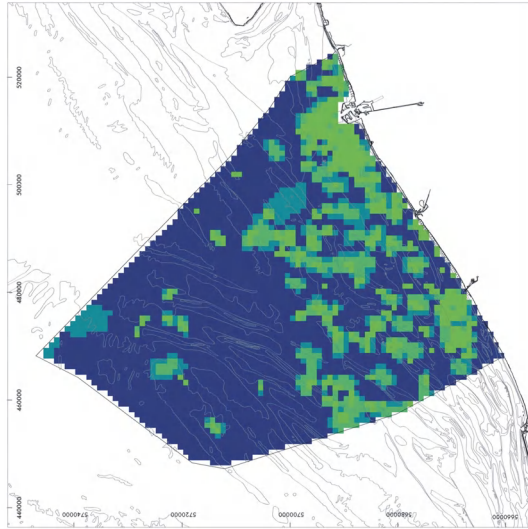
Original data source: IVS-SRK (Ministry of the Flemish Community & Dutch Ministry of Transport, Public Works and Water Management)
Impact analysis: ECOLAS NV
Map preparation: RCMG - Ghent University

Data cover anchorage activities from 01 April 2003 - 31 March 2004
May 2005

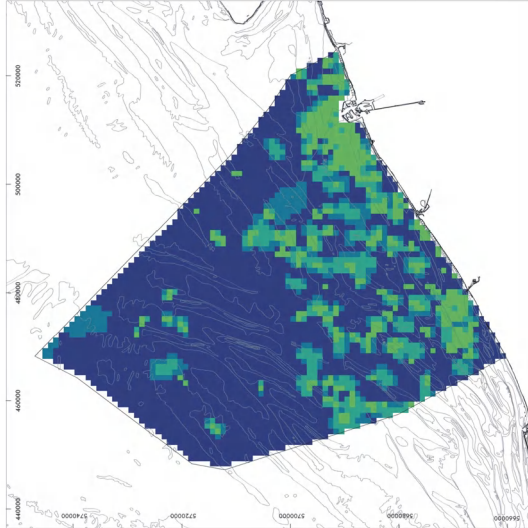


Impact maps - Recreational fisheries

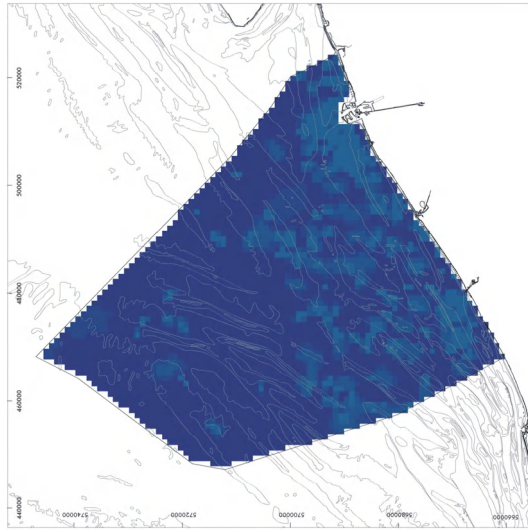
Chemical impact



Ecological impact



Physical impact



Relative impact value



High: 9

Low: 0

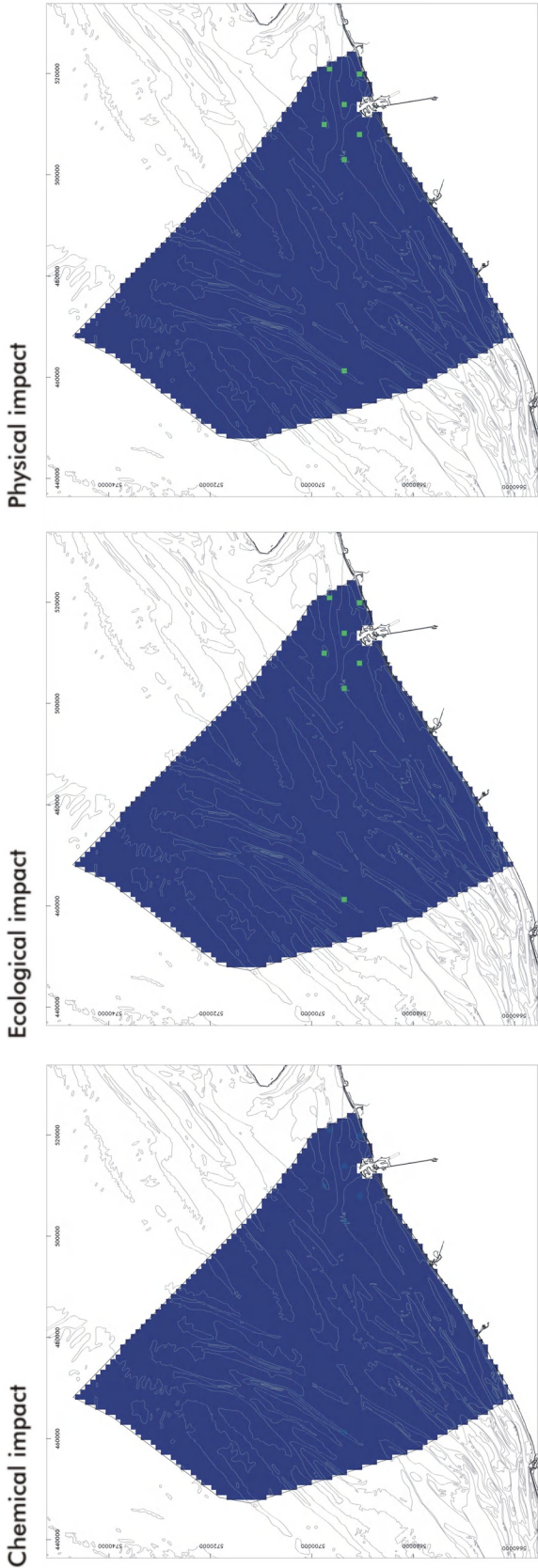
Original data source: Institute for Nature Conservation
Impact analysis: ECOLAS NV
Map preparation: RCMG - Ghent University

Data cover observed recreational fishery activities from 30 September 1992 - 25 July 2003

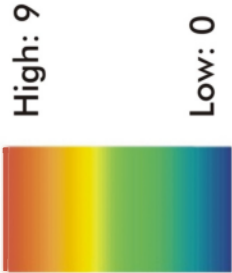
May 2005



Impact maps - Weather mast construction



Relative impact value



Original data source: Ministry of the Flemish Community, Department of Environment and Infrastructure, Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office & Hydrometeo, "Overview of positions (WGS84) weather masts and radar mast Oost Dijk on nautical maps"

Impact analysis: ECOLAS NV

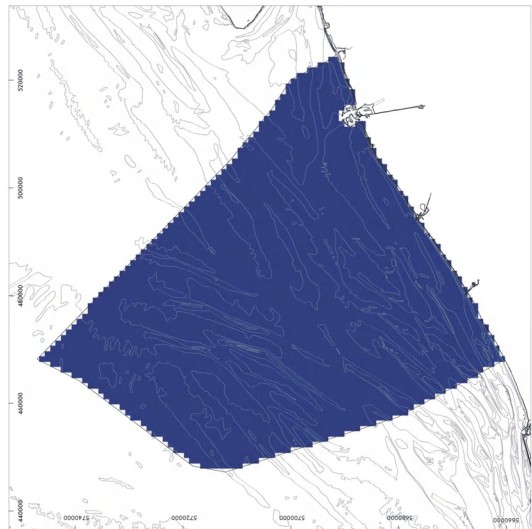
Map preparation: RCMG - Ghent University

May 2005

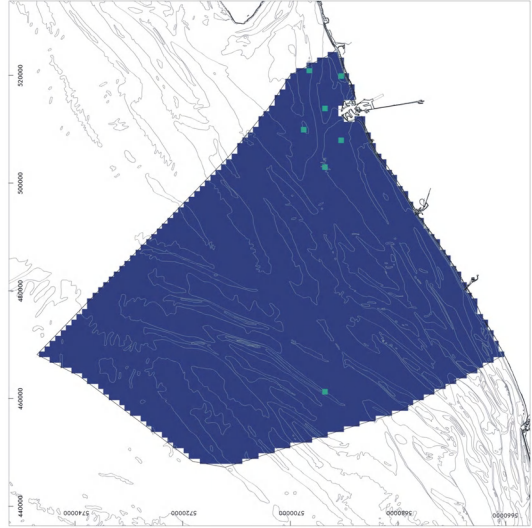


Impact maps - Weather mast exploitation

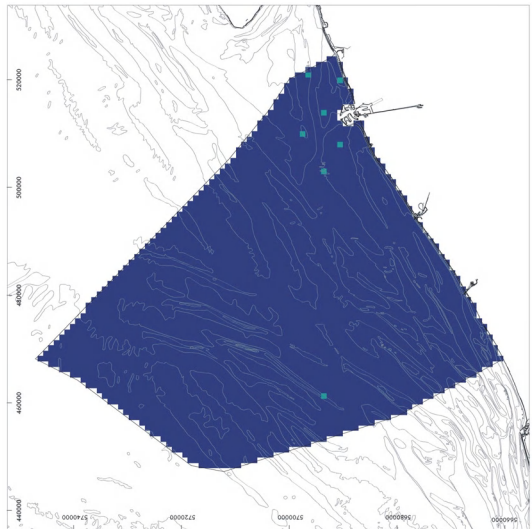
Chemical impact



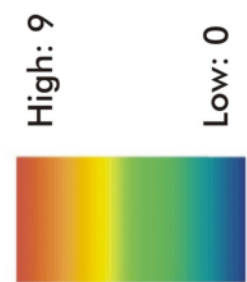
Ecological impact



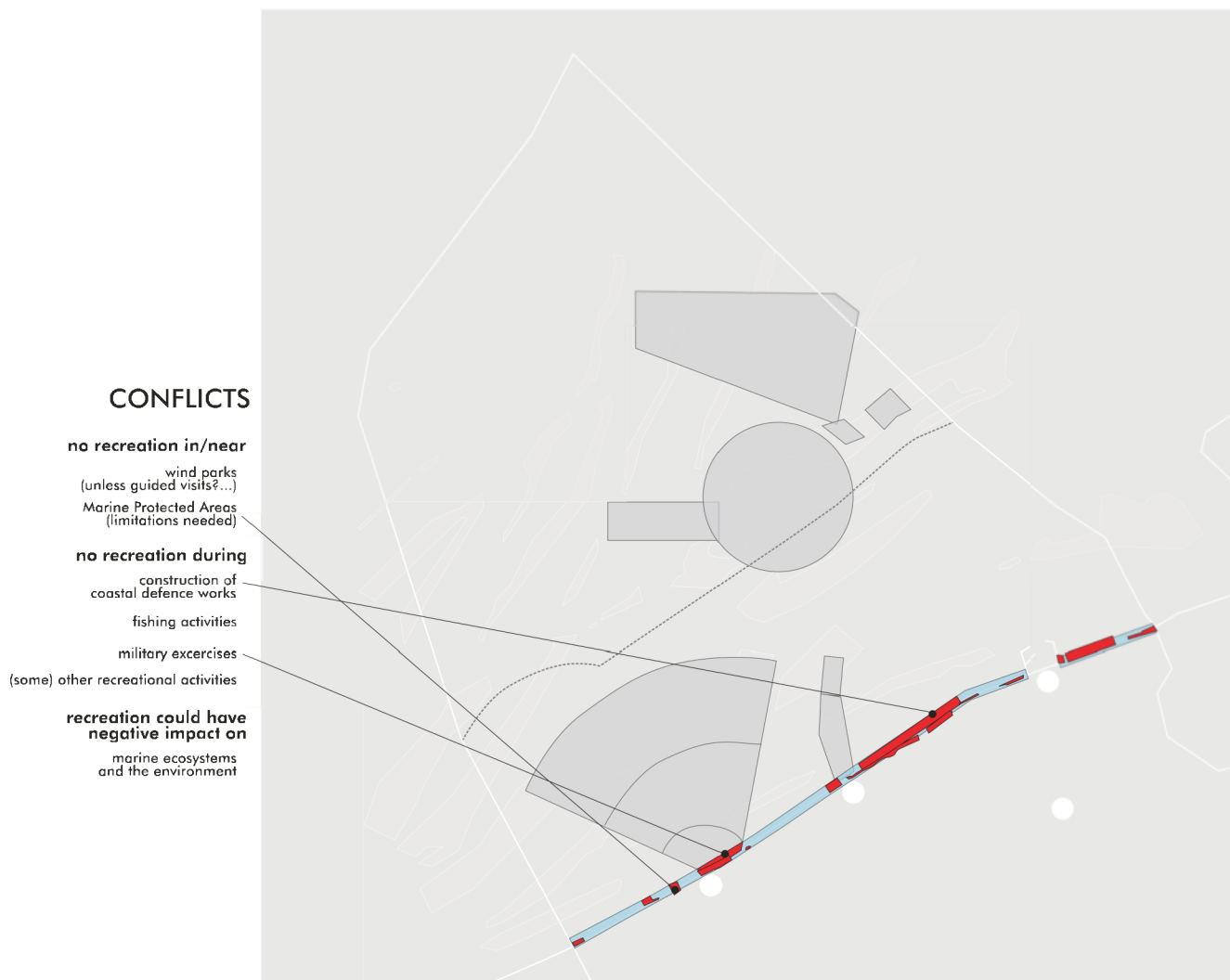
Physical impact



Relative impact value



Original data source: Ministry of the Flemish Community, Department of Environment and Infrastructure, Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office & Hydrometeo, "Overview of positions (WGS84) weather masts and radar mast Oost Dyck on nautical maps"
Impact analysis: ECOLAS NV
Map preparation: RCMG - Ghent University
May 2005



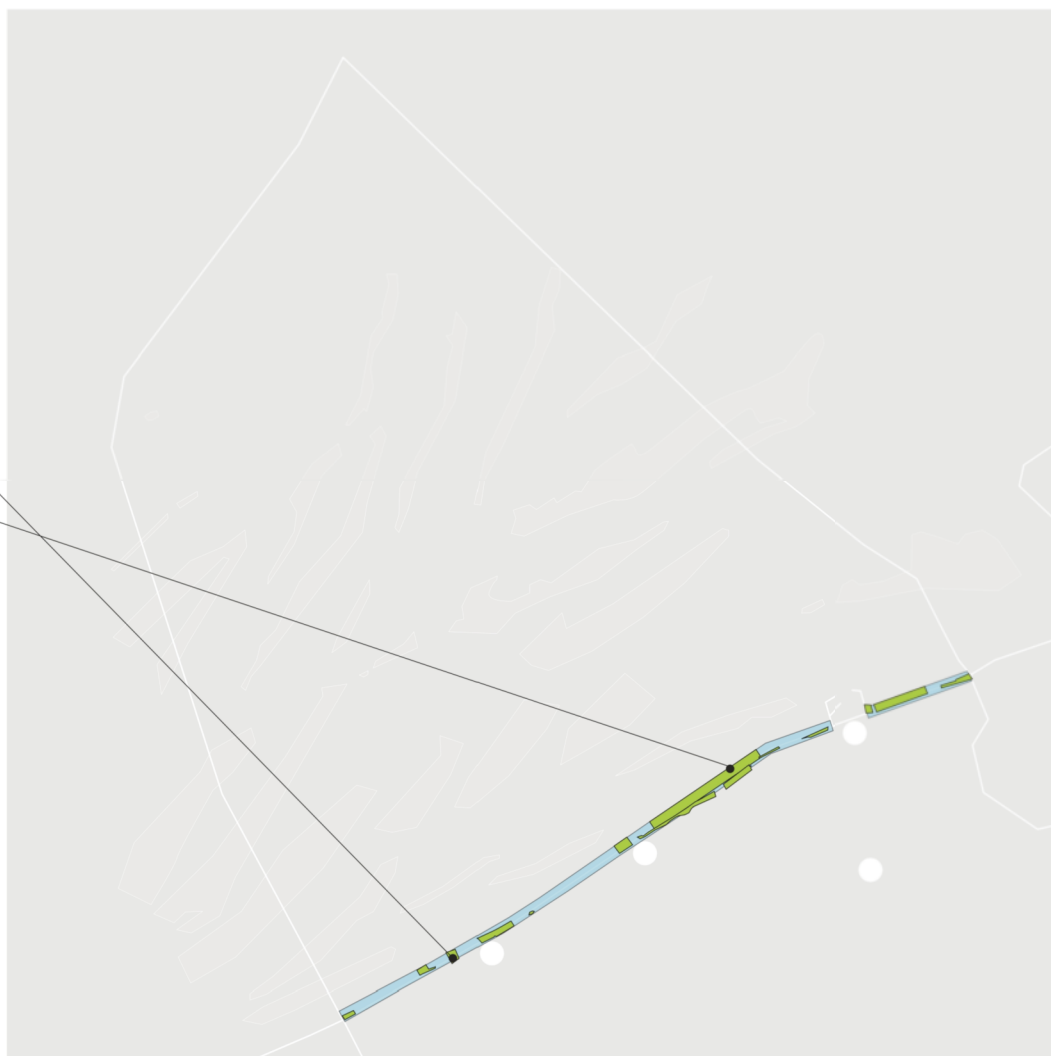
Map II.4a. Tourism and recreation in the coastal strip: conflicts with other uses
 (Data analysis and Map preparation: Maritime Institute - Gent University)

 conflicts


POSITIVE EFFECTS

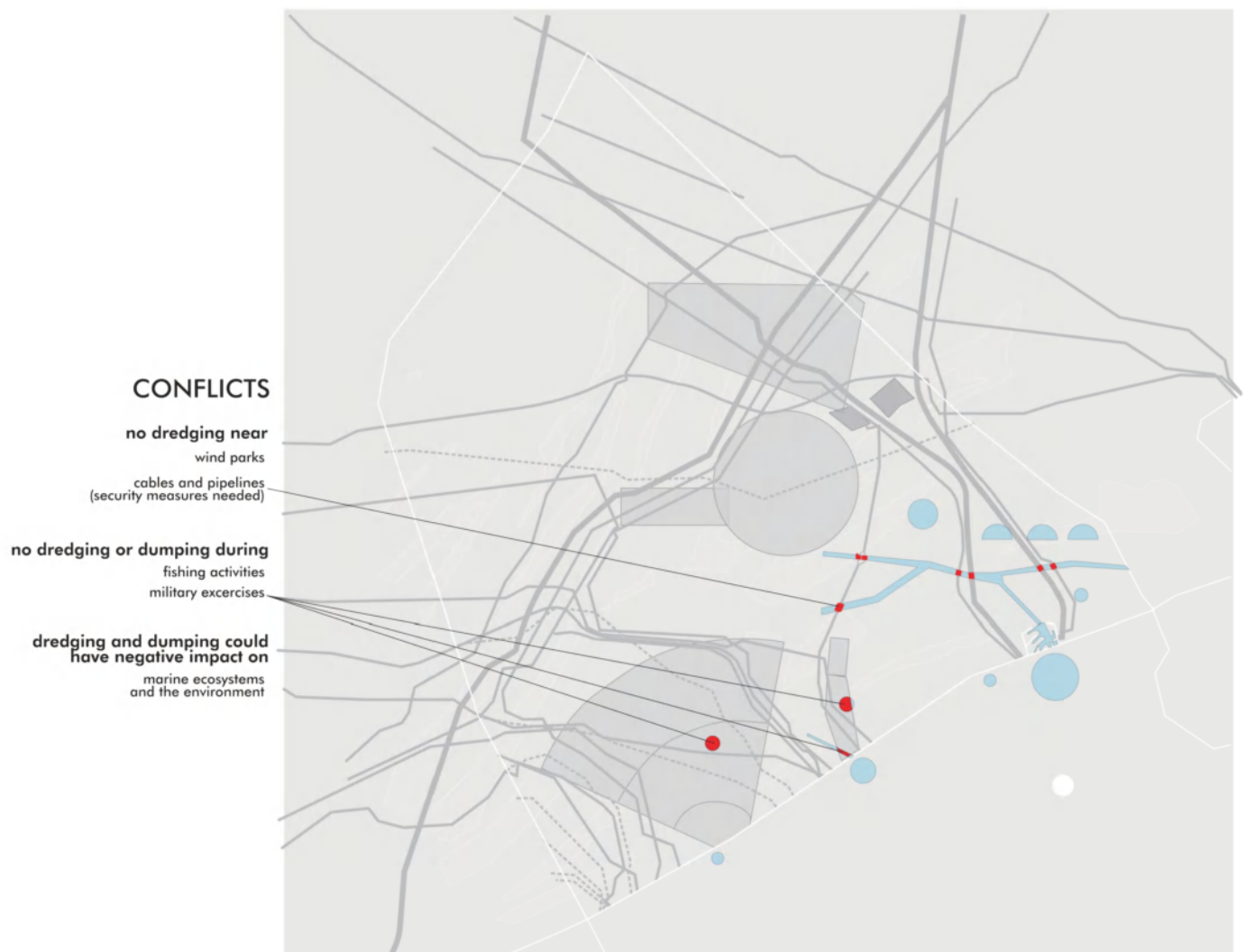
Marine Protected Areas

beach nourishment



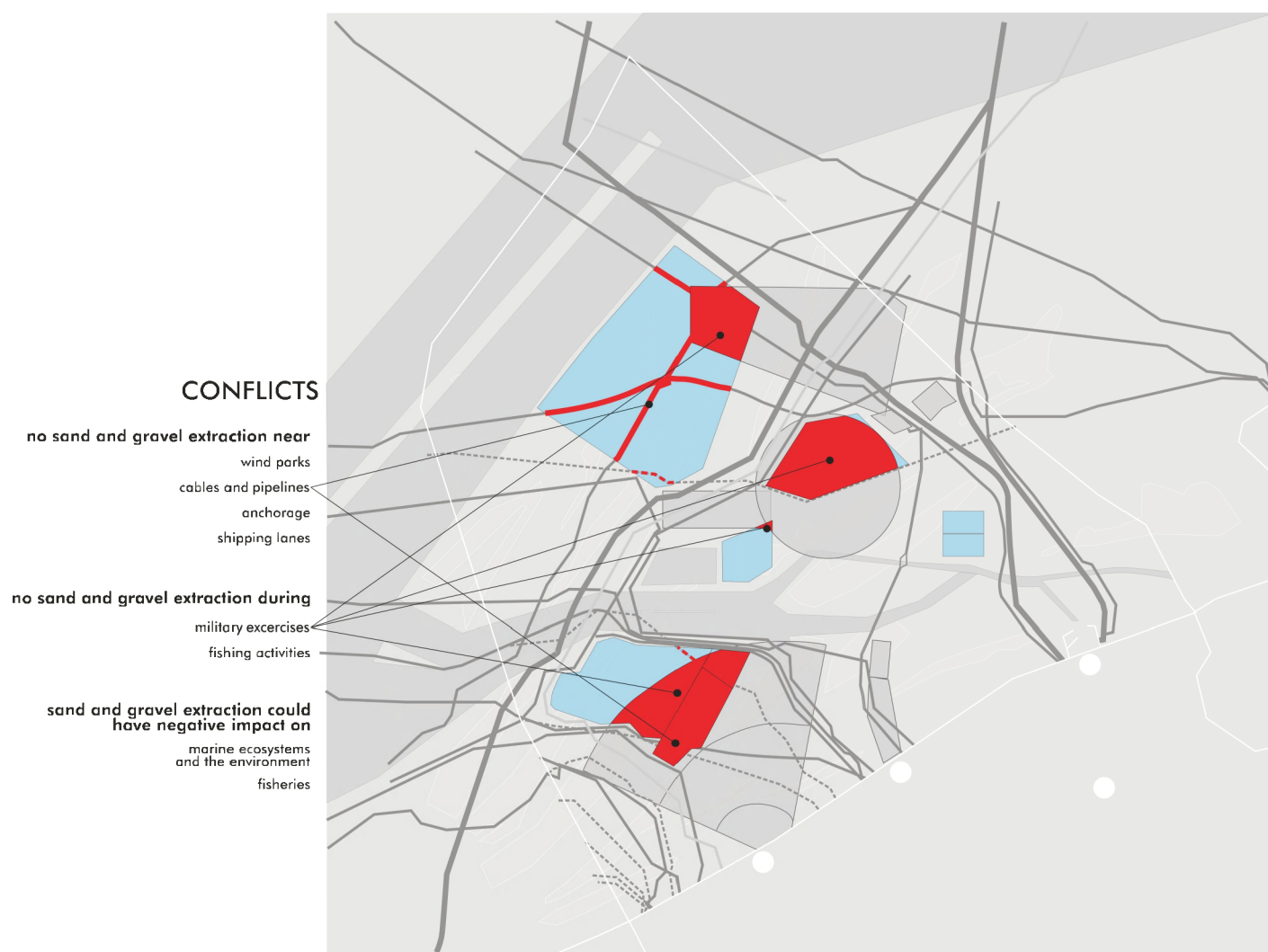
Map II.4b. Tourism and recreation in the coastal strip: positive interactions with other uses
(Data analysis and Map preparation: Maritime Institute - Gent University)

 positive interactions



Map II.4c. Dredging and dumping of dredge disposal: conflicts with other uses
 (Data analysis and Map preparation: Maritime Institute - Gent University)

 conflicts

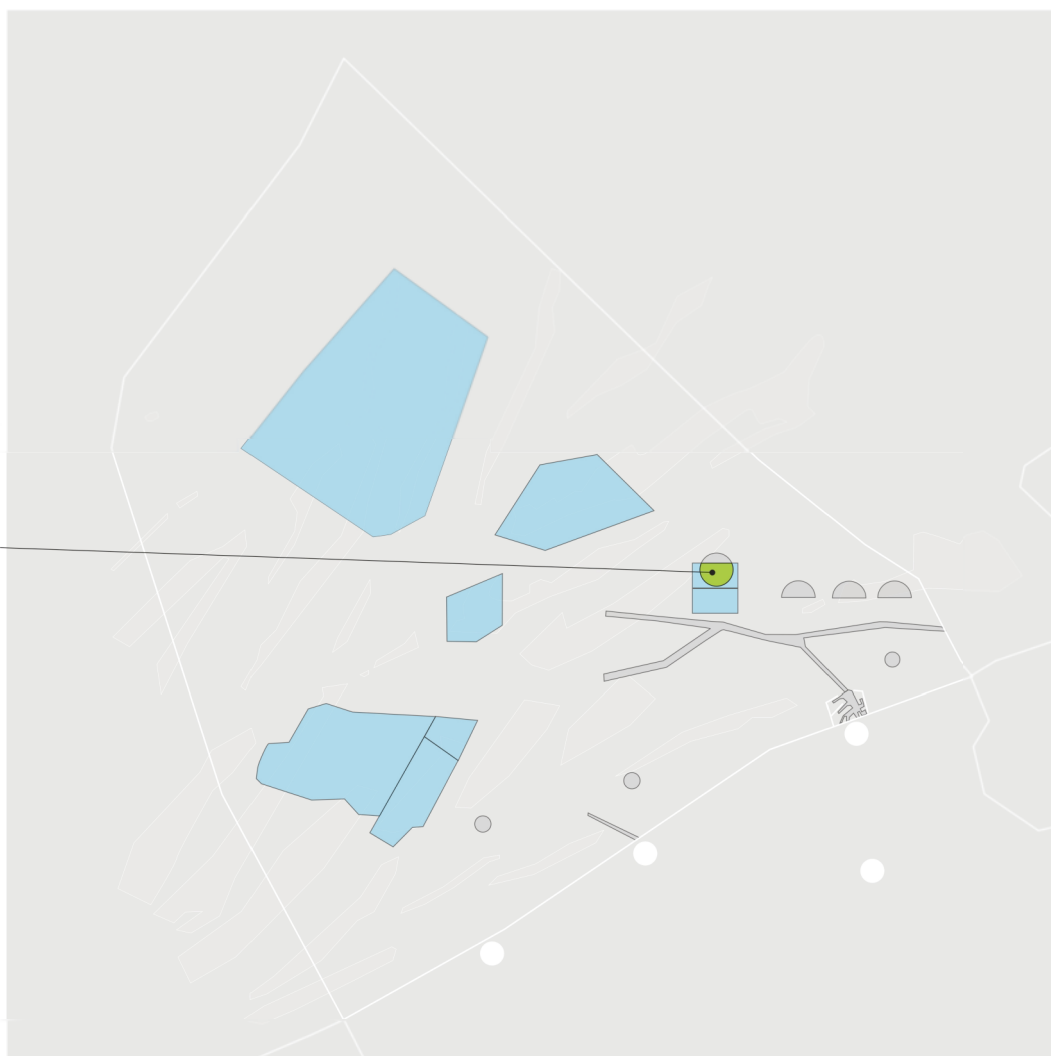


Map II.4e. Sand and gravel extraction: conflicts with other uses
 (Data analysis and Map preparation: Maritime Institute - Gent University)




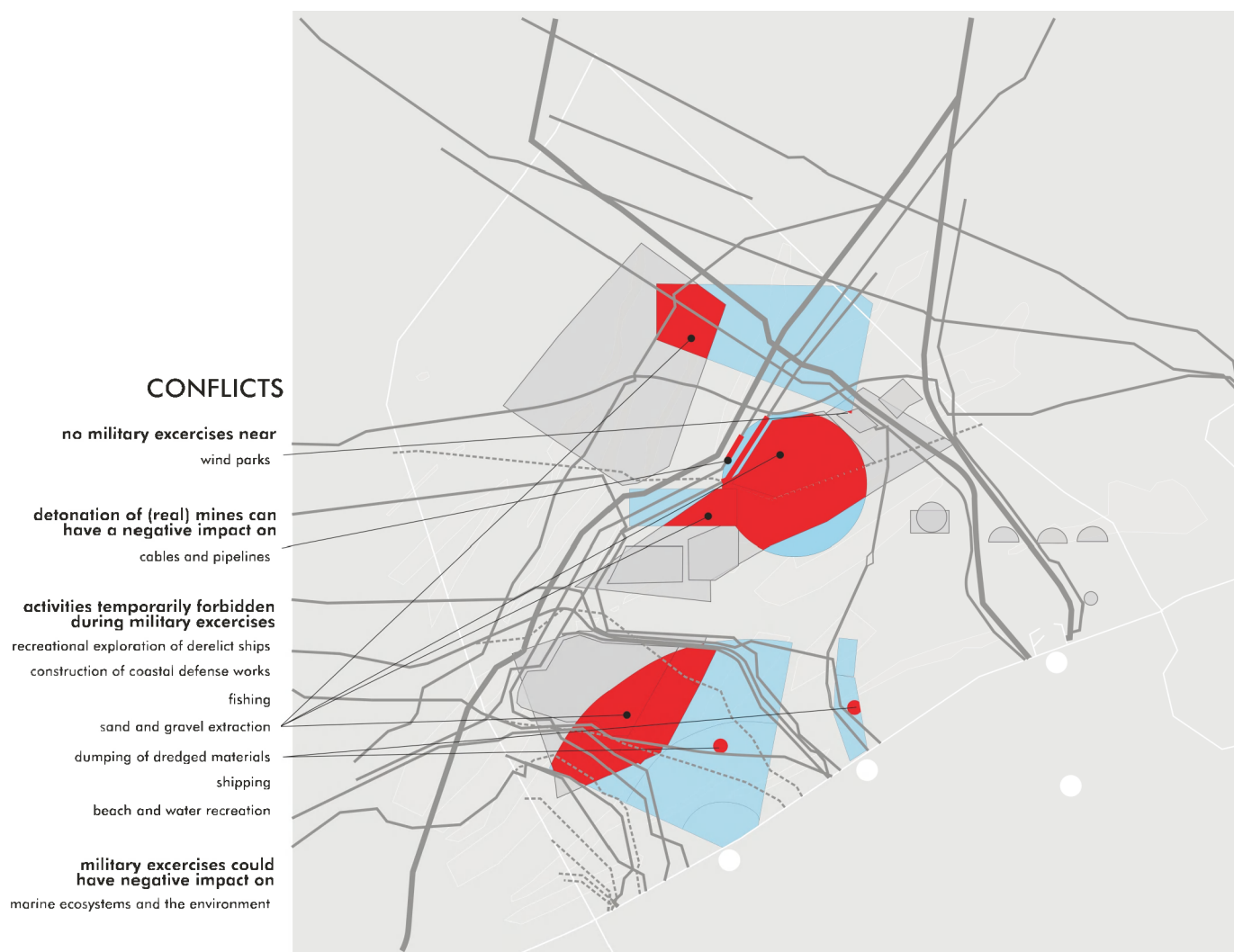
POSITIVE EFFECTS

extraction of dredged materials for
land reclamation



Map II.4f. Sand and gravel extraction: positive interactions with other uses
(Data analysis and Map preparation: Maritime Institute - Gent University)

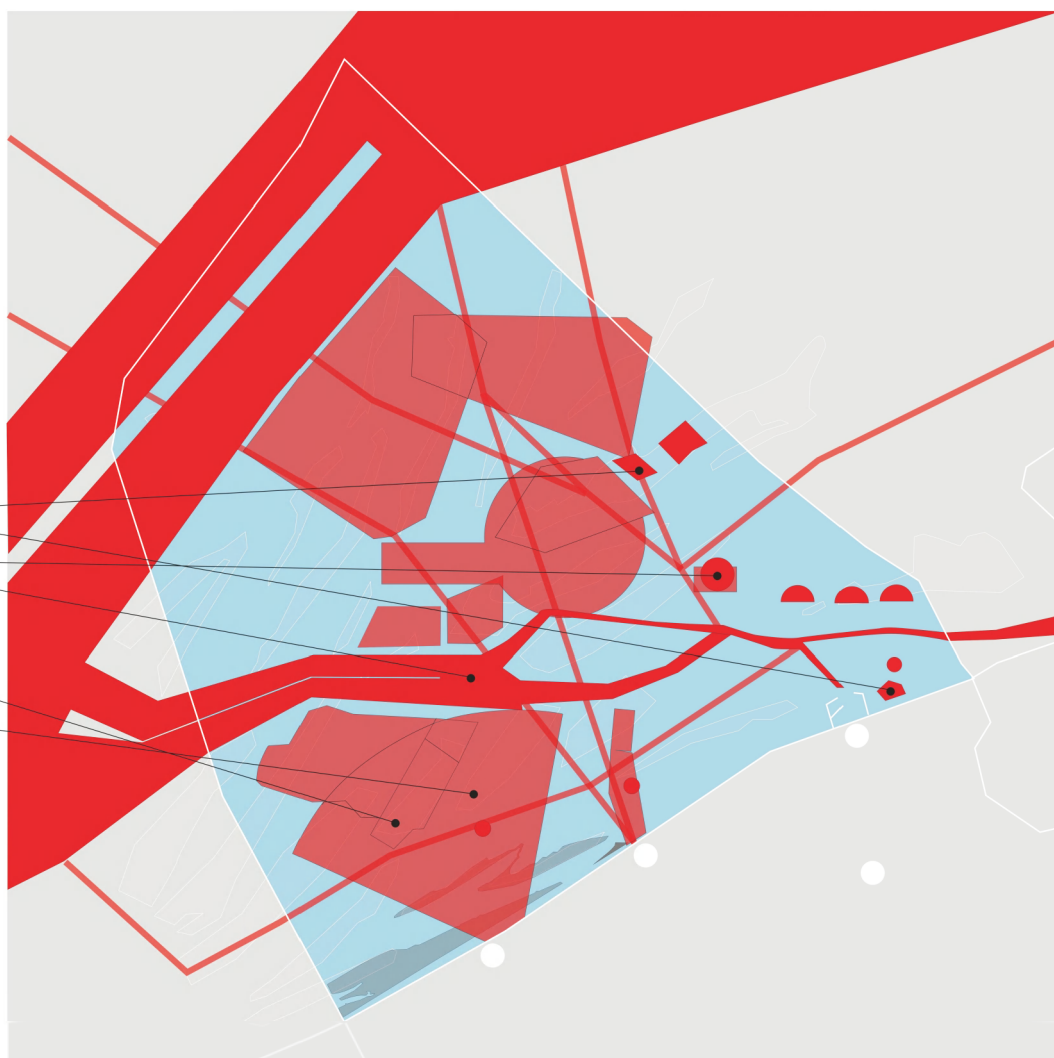
 positive interactions



Map II.4g. Military exercises: conflicts with other uses
 (Data analysis and Map preparation: Maritime Institute - Gent University)

 conflicts

- CONFLICTS**
- no fishing activities possible
 - wind parks
 - war ammunition disposal site 'Paardenmarkt'
 - dredge disposal sites
 - shipping lanes
 - no fishing activities possible during
 - sand and gravel extraction
 - military exercises
 - fishing activities could have negative impact on
 - marine ecosystems and the environment



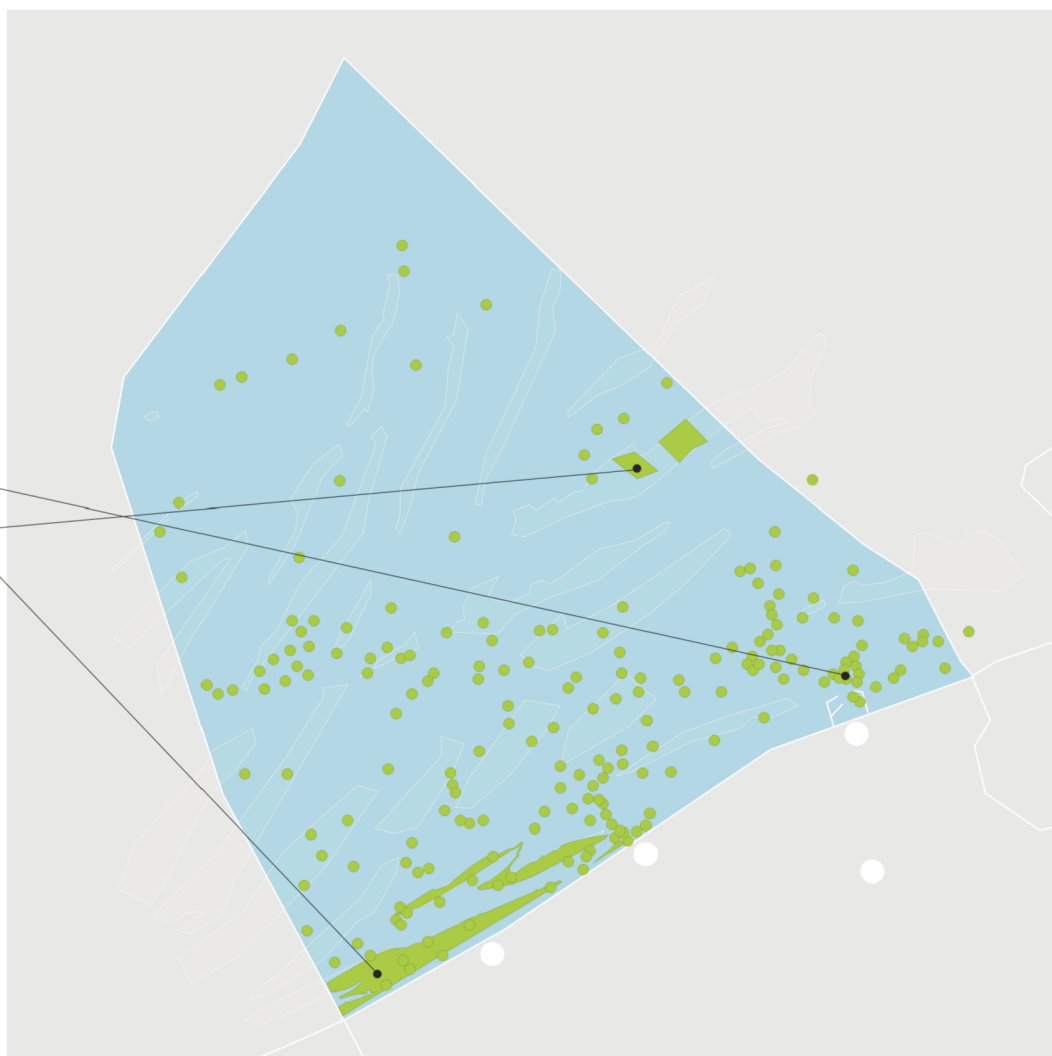
Map II.4h. Fisheries: conflicts with other uses

(Data analysis and Map preparation: Maritime Institute - Gent University)



POSITIVE EFFECTS

derelict ships
wind parks
Marine Protected Areas

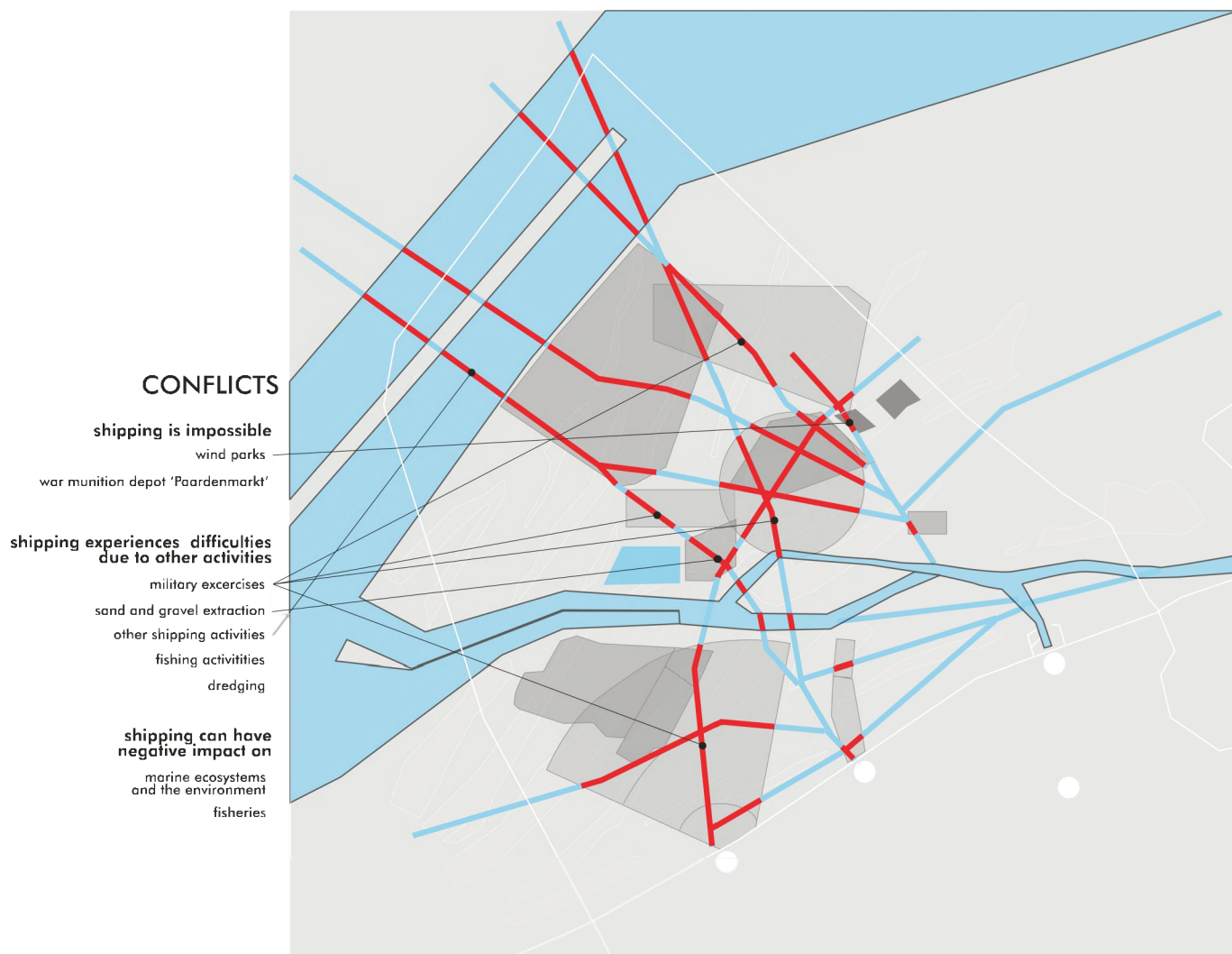


Map II.4i. Fisheries: positive interactions with other uses

(Data analysis and Map preparation: Maritime Institute - Gent University)



positive interactions



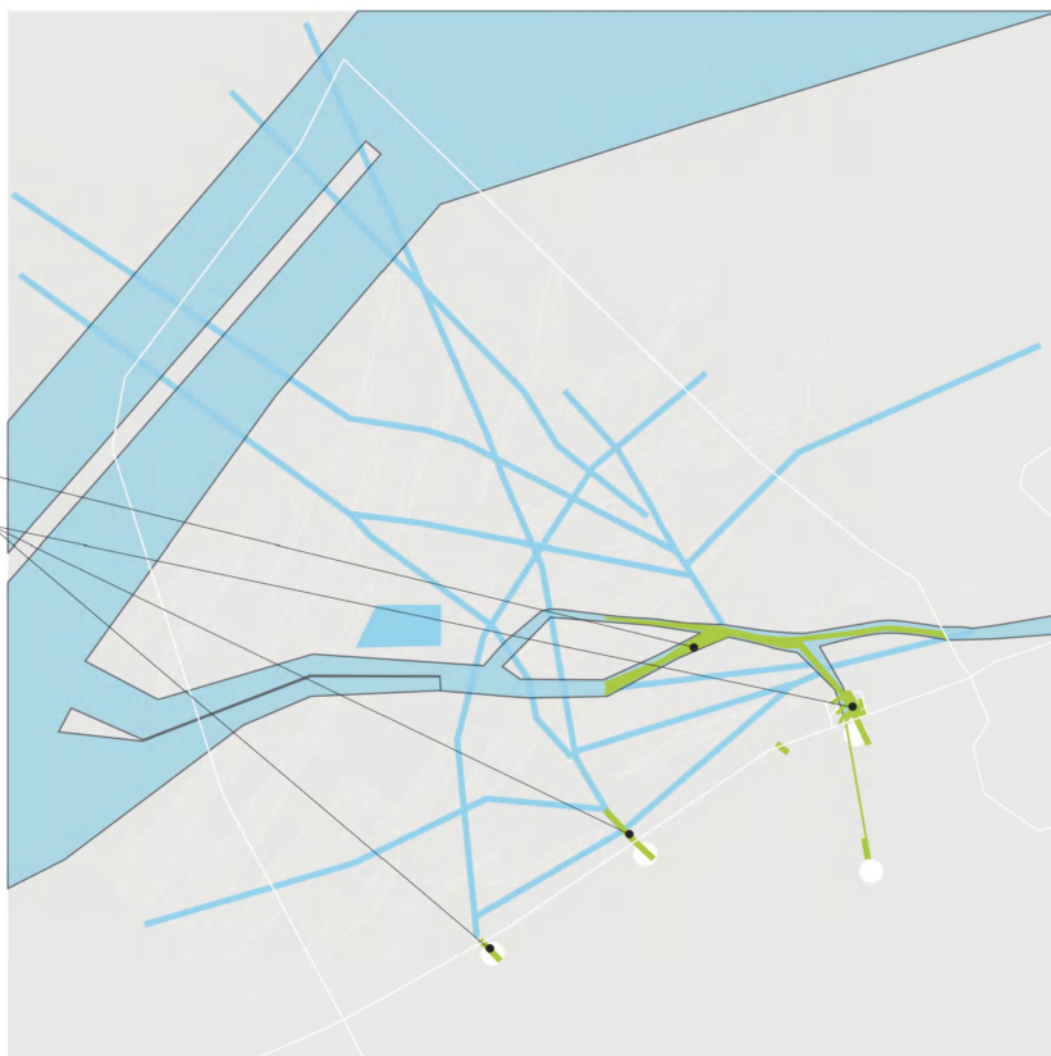
Map II.4j. Shipping: conflicts with other uses

(Data analysis and Map preparation: Maritime Institute - Gent University)




POSITIVE EFFECTS

- dredging for shipping activities on the shipping lanes
- dredging for shipping activities in the ports



Map II.4k. Shipping: positive interactions with other uses

(Data analysis and Map preparation: Maritime Institute - Gent University)

 positive interactions

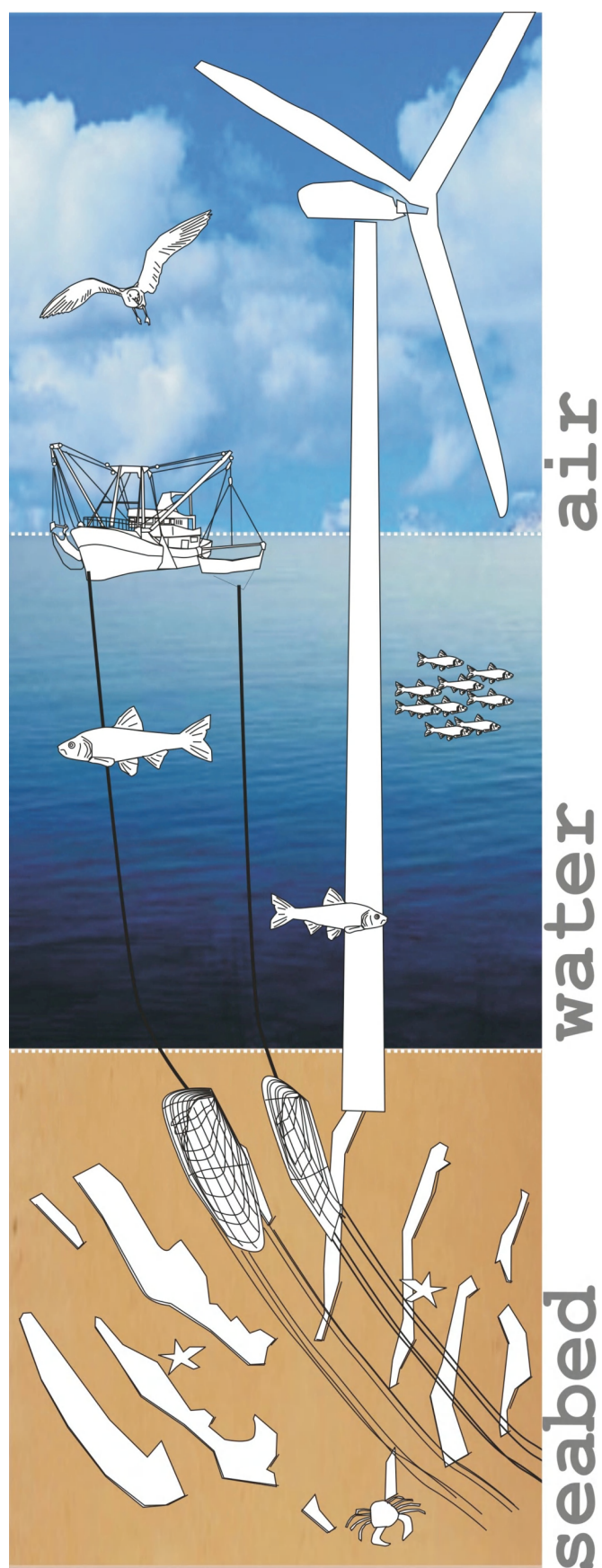


Figure III.1.1a. Mutual interaction between seabed, water column and air
(Maritime Institute - Gent University)



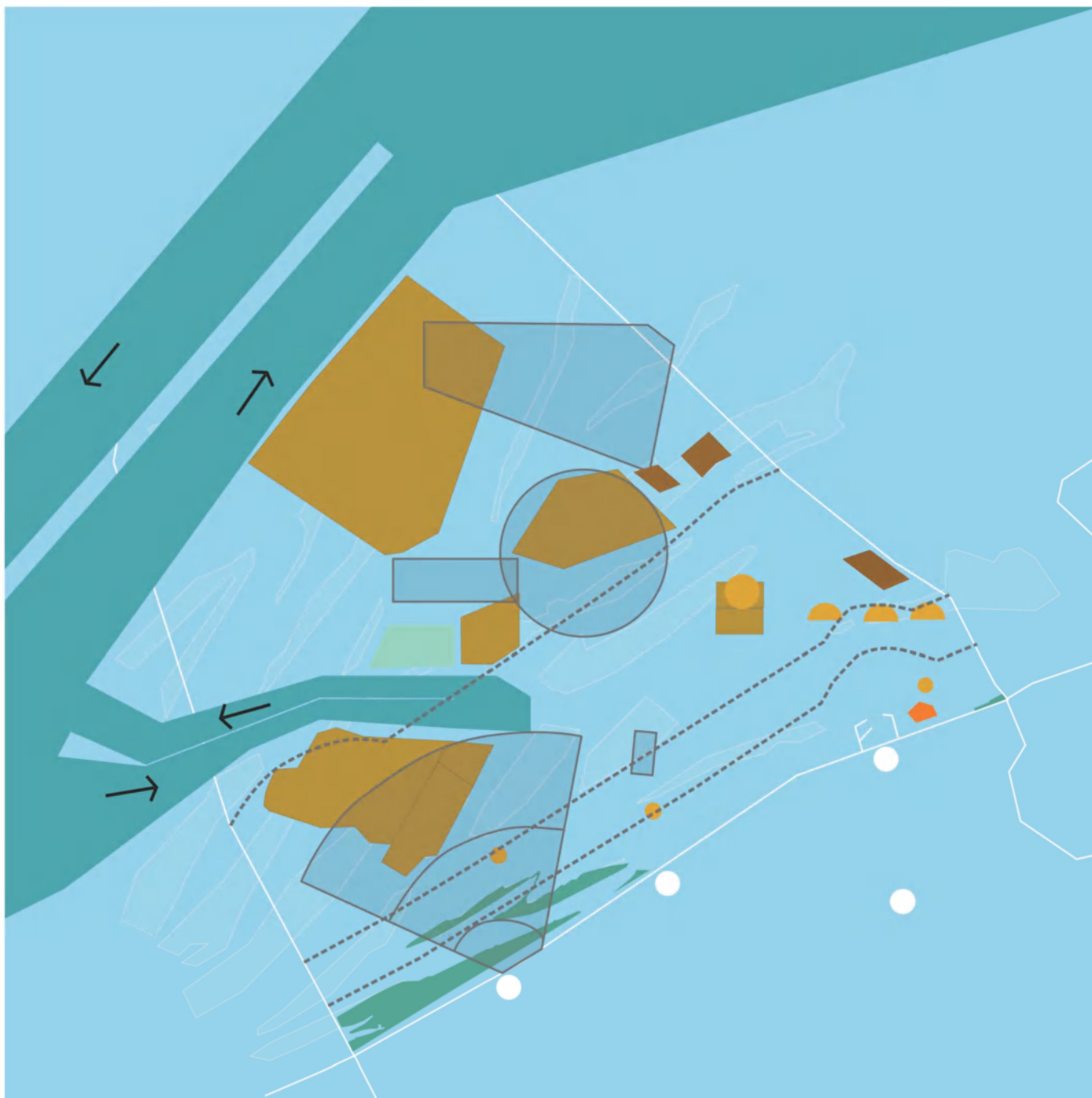
Map III.1.1a. The BPNS situated in the North Sea



Map III.1.1b. Conceptual view of the main sand transport directions on the seabed




(Original data source: Lanckneus, J., Van Lancker, V., Moerkerke, G., Van Den Eynde, D., Fettweis, M., De Batist, M. and Jacobs, P. (2001). Investigation of natural sand transport on the Belgian continental shelf, BUDGET (Beneficial usage of data and geo-environmental techniques). Final report. Federal Office for Scientific, Technical and Cultural Affairs (OSTC);

Map: Maritime Institute - Gent University)



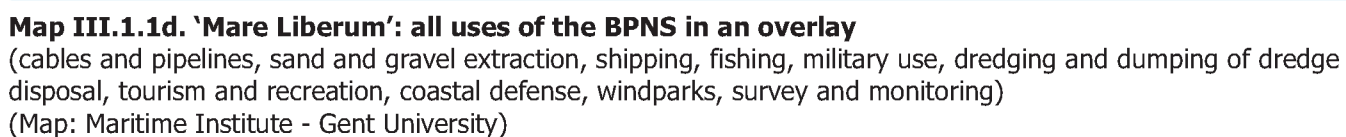
Map III.1.1c. Planning aspects: sites and areas with a legal status in the BPNS
 (Map: Maritime Institute - Gent University)

International framework:

-  shipping lanes:
international traffic separation scheme
-  anchorage
-  Ramsar area

National framework:

-  zones for military use
-  licence zones for
wind parks
-  licence zones for
sand and gravel extraction
-  dumping sites for
dumping of dredgings
-  fishery zones
-  Paardenmarkt:
historical war munition dump site



(cables and pipelines, sand and gravel extraction, shipping, fishing, military use, dredging and dumping of dredge disposal, tourism and recreation, coastal defense, windparks, survey and monitoring)

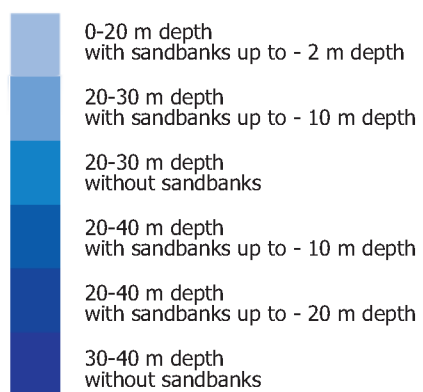
(Map: Maritime Institute - Gent University)

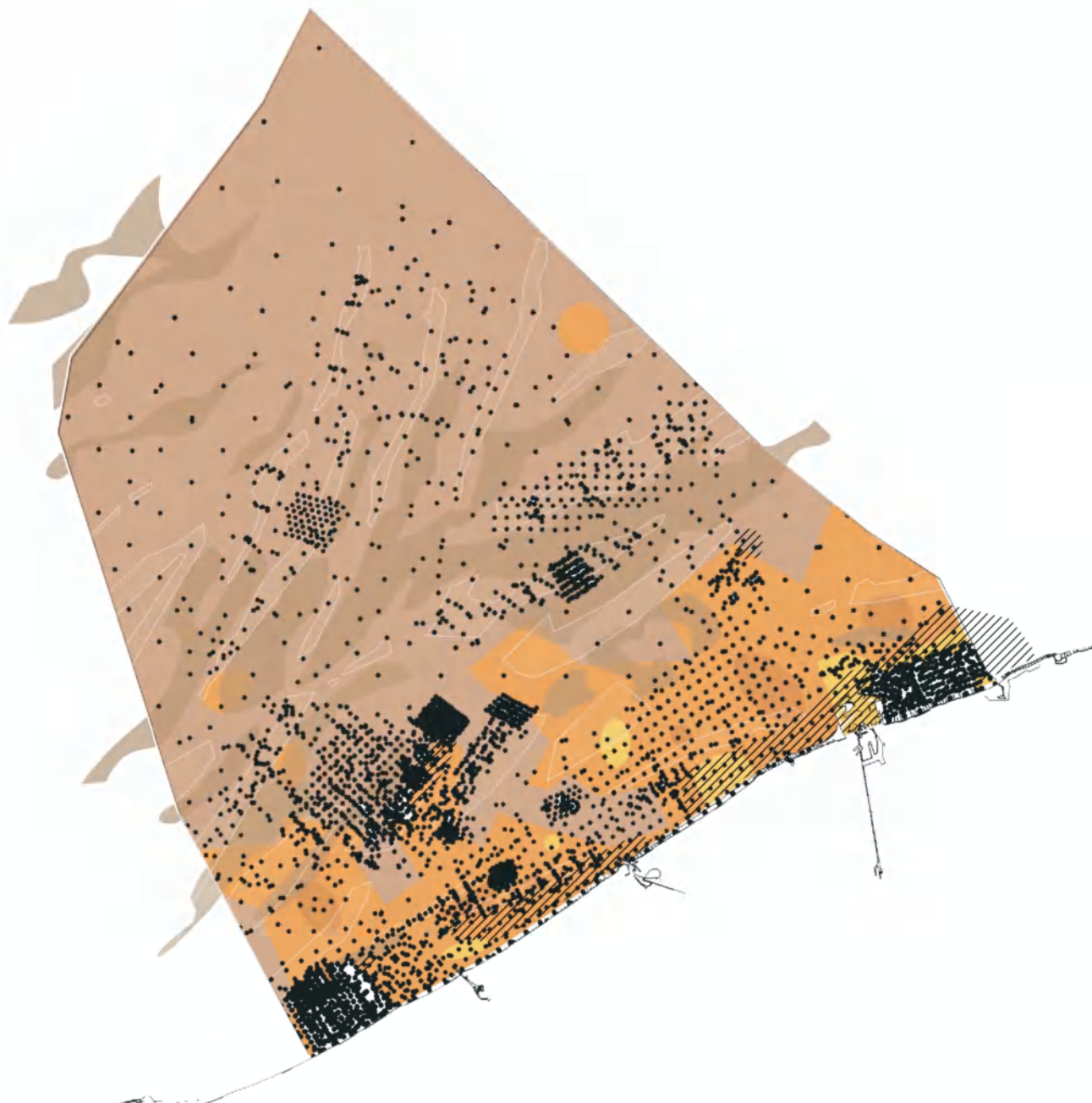


Map III.1.2.1a. Water depth in the BPNS

(Original data source: www.mumm.ac.be/EN/Management/Atlas/bath_sandbanks.php;

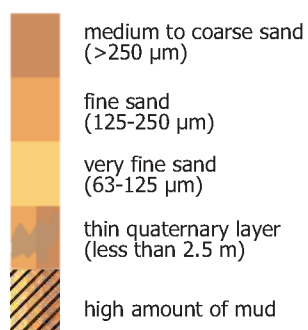
Structure map: Maritime Institute - Gent University)





Map III.1.2.1b. Median grain size of the sand fraction in overlay with locations of sediment samples

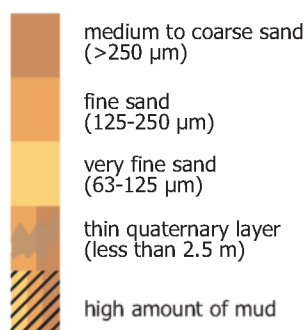
(Original data source: sedisurf@database, hosted by RCMG - Gent University; Data analysis: RCMG - Gent University; Map: Maritime Institute - Gent University)





Map III.1.2.1c. Median grain size of the sand fraction

(Original data source: sedisurf@database, hosted by RCMG - Gent University; Data analysis: RCMG - Gent University; Structure map: Maritime Institute - Gent University)

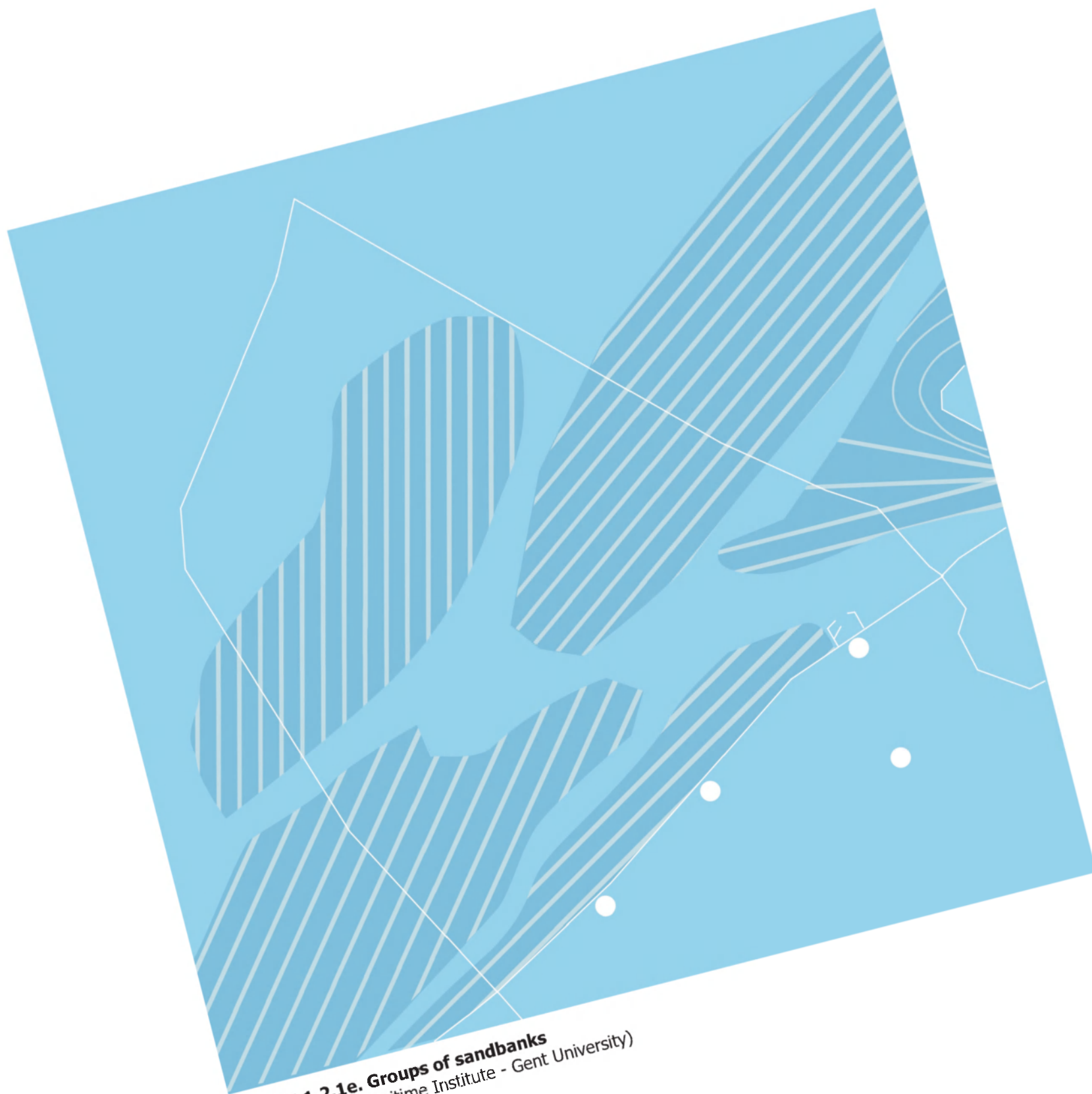




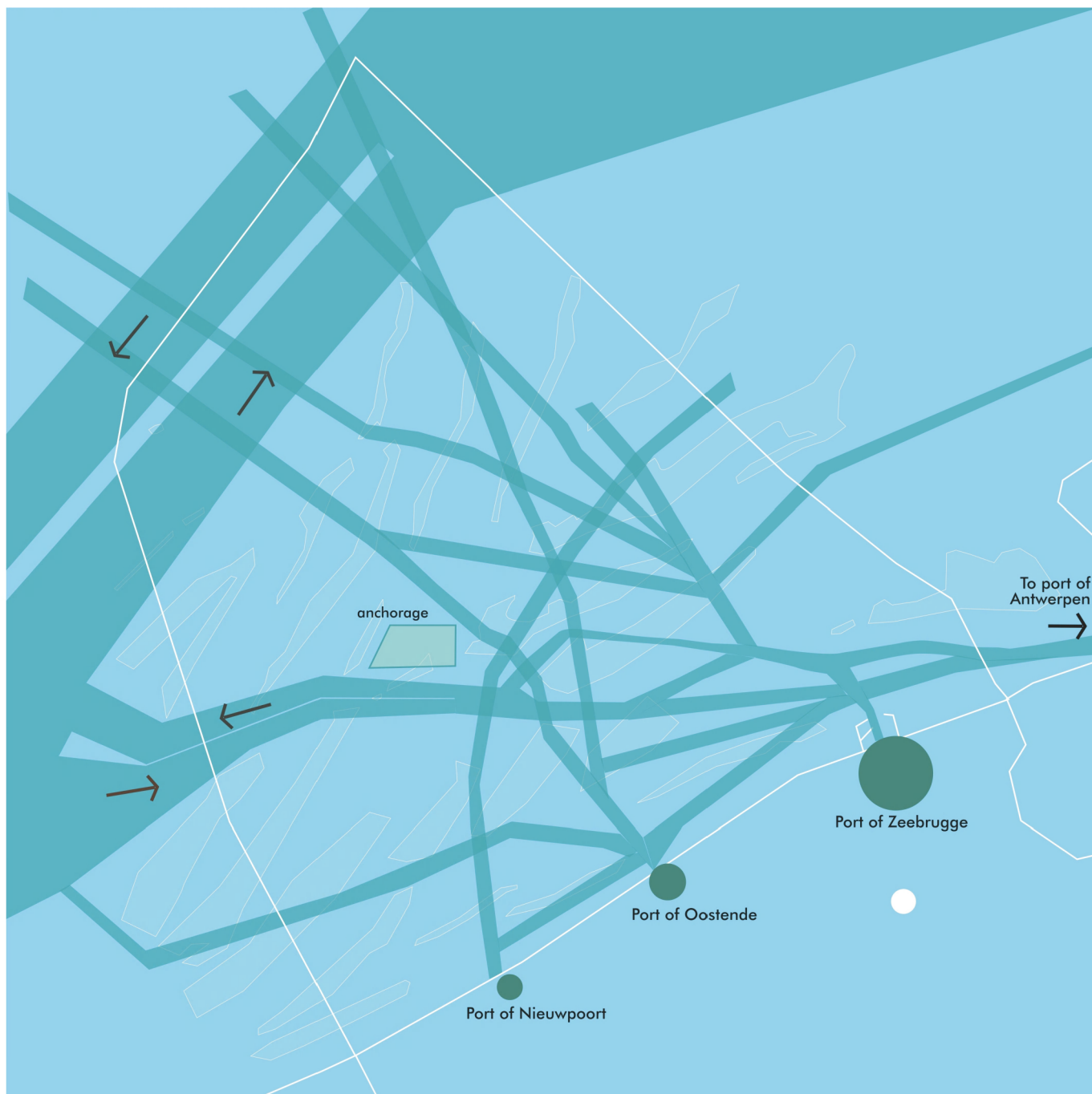
Map III.1.2.1d. Location and names of the sandbanks in the BPNS

(Original data source: Ministry of the Flemish Community, Department of Environment and Infrastructure, Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office;

Map: Maritime Institute - Gent University adapted from RCMG - Gent University)



Map III.1.2.1e. Groups of sandbanks
(Structure map: Maritime Institute - Gent University)

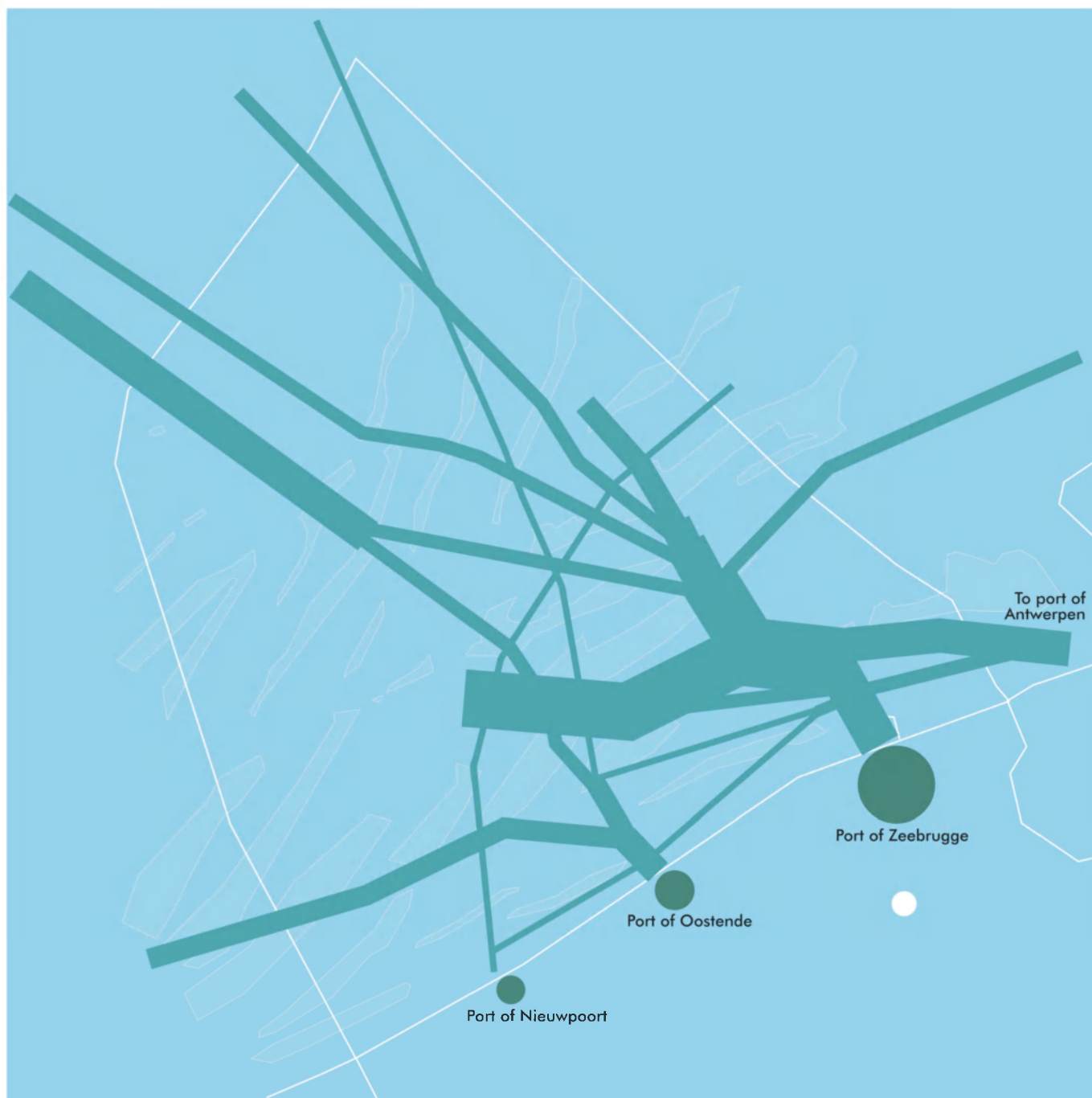


Map III.1.2.2a. Shipping in the BPNS

(Original data source: International Maritime Organisation, Ships' Routeing, London, 6th Edition, 2003 / IVS-SRK, Ministry of the Flemish Community and Dutch Ministry of Transport, Public Works and Water Management / Transeuropa Ferries, Ferryways;

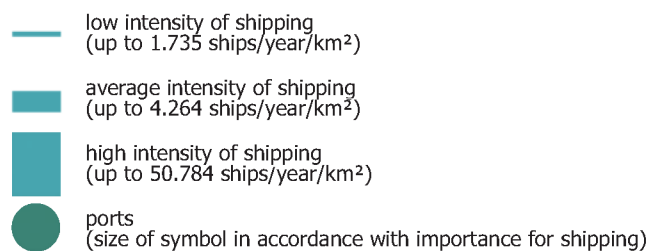
Map: Maritime Institute - Gent University adapted from RCMG - Gent University)

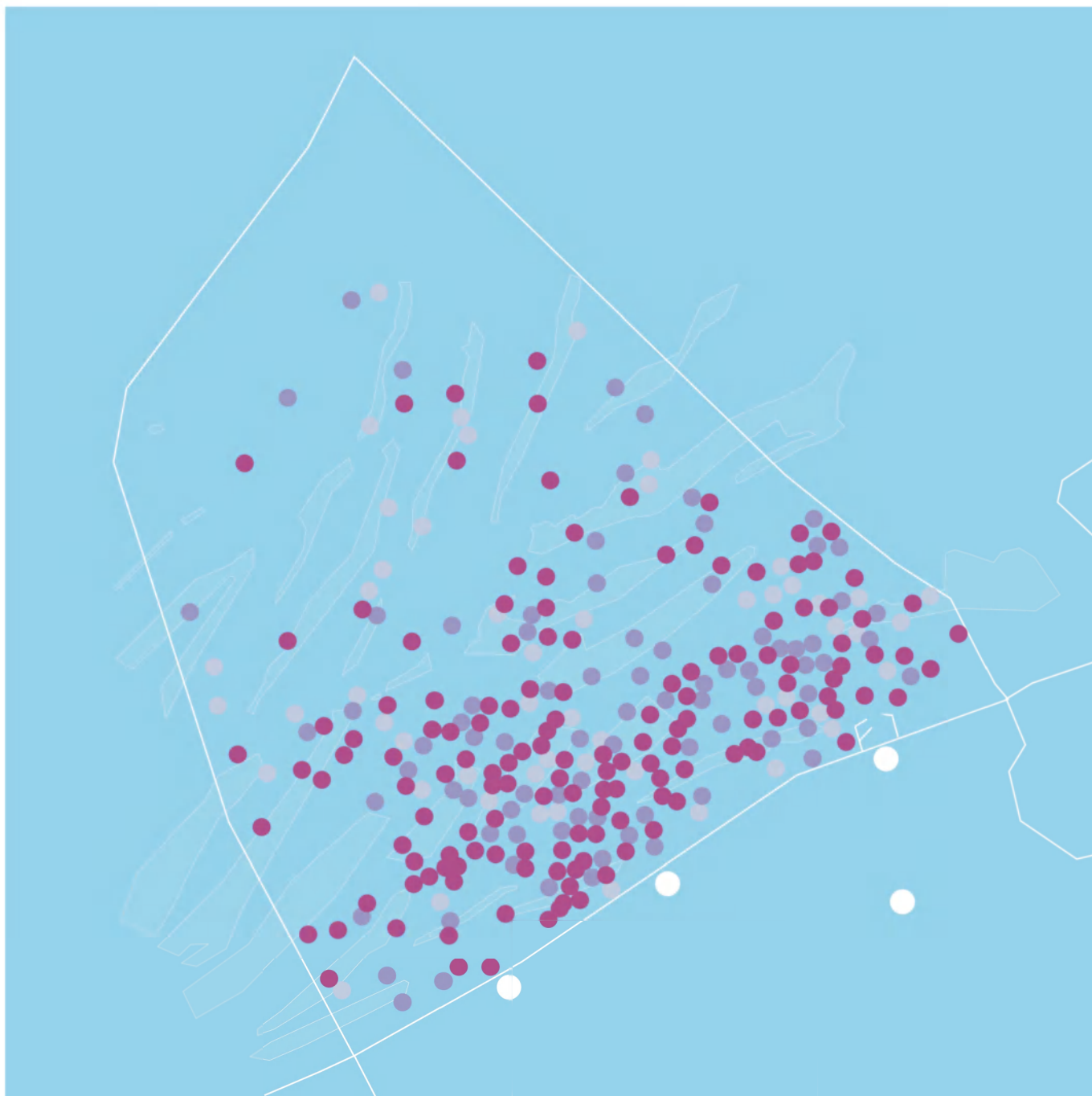




Map III.1.2.2b. Shipping intensities in the BPNS

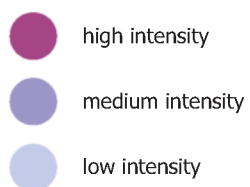
(Original data source: IVS-SRK, Ministry of the Flemish Community and Dutch Ministry of Transport, Public Works and Water Management / Transeuropa Ferries, Ferryways; Data analysis: Ecolas nv / Maritime Institute - Gent University; Map: Maritime Institute - Gent University adapted from RCMG - Gent University)

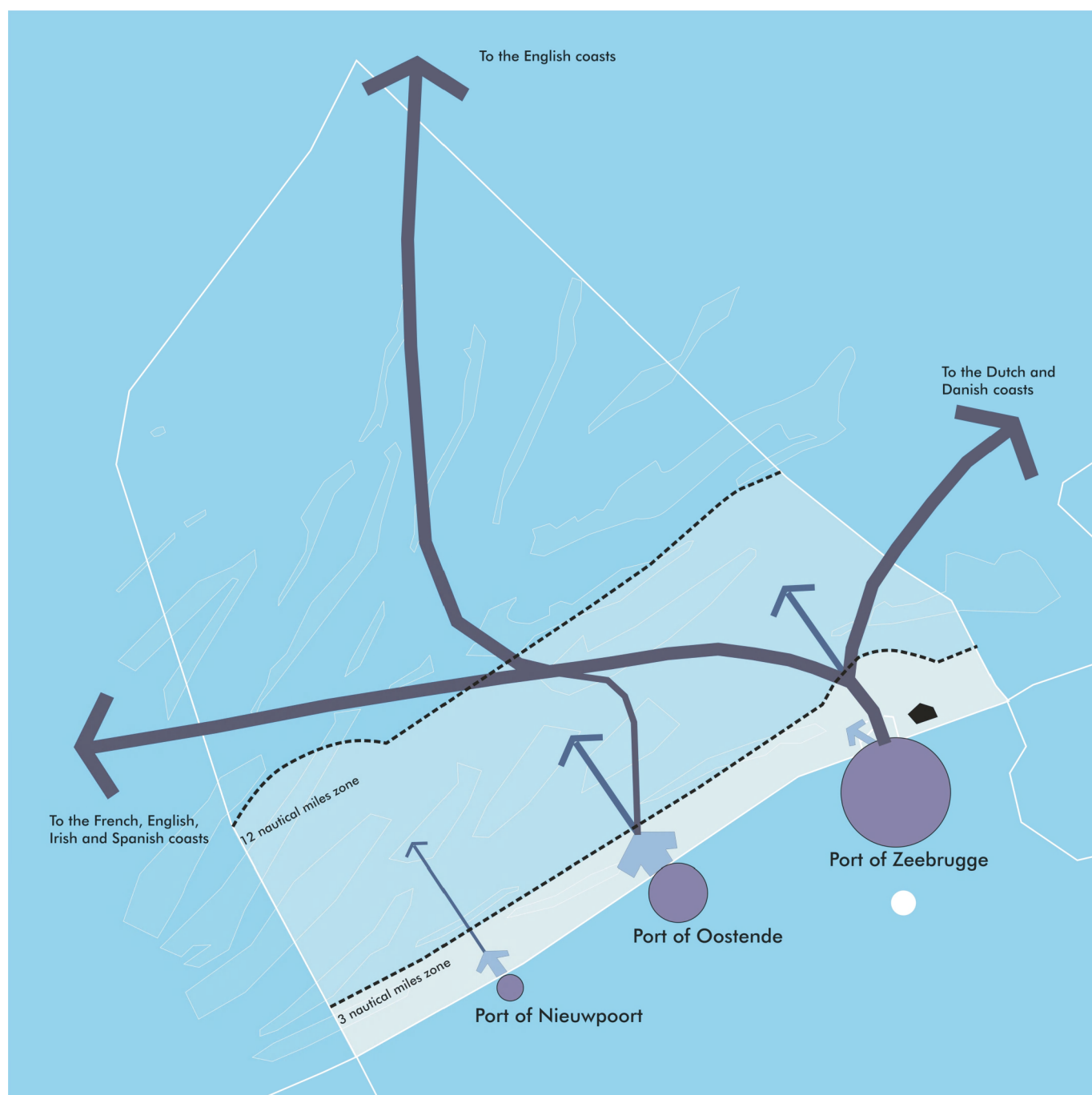




Map III.1.2.2c. Fishing intensities in the BPNS






(Original data source: Institute for Nature Conservation; Data analysis: Ecolas nv;
Map: Maritime Institute - Gent University adapted from RCMG - Gent University)





Map III.1.2.2d. Fishing activities in the BPNS

(Original data source: Ministry of the Flemish Community, Department of Environment and Infrastructure, Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office / Ministry of the Flemish Community, Agriculture Administration, Division of Fisheries, De Belgische Zeevisserij: Aanvoer en besomming, 2003, p 15.; Data analysis and structure map: Maritime Institute - Gent University)

-  large segment of the fishing fleet
-  medium segment of the fishing fleet
-  small segment of the fishing fleet
-  fishing port (size of symbol in accordance with importance for fish landings - fish landings 2003: Nieuwpoort 296, Oostende 6.184, Zeebrugge 13.627)
-  Paardenmarkt (war amunition depot): fishing prohibited

large segment: large fishing boats with a capacity over 221 kW (300 PK) and a gross tonnage over 70 GT. These ships stay on average 10 days at sea.

medium segment: these fishing boats have a capacity up to 221 kW (300 PK) and a gross tonnage slightly over 70 GT. These ships are not allowed within the 3 nautical miles zone. Usually they sail within the 12 nautical miles zone.

small segment: these fishing boats also have a capacity up to 221 kW (300 PK), but their gross tonnage is smaller compared with the medium segment (below 70 GT). These boats usually sail within the 3 nautical miles zone and usually stay no longer than 24 hours at sea.

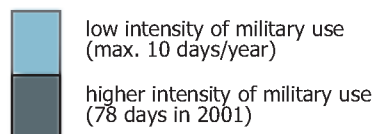


Map III.1.2.2e. Military exercises in the BPNS

(Original data source: Ministry of the Flemish Community, Department of Environment and Infrastructure, Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office, BAZ / spokesmen of the Army, Air Force and Navy sections, Federal Government Department of Defense;

Data analysis: Marine Biology Section - Gent University / RCMG - Gent University;

Map: Maritime Institute - Gent University adapted from RCMG - Gent University)

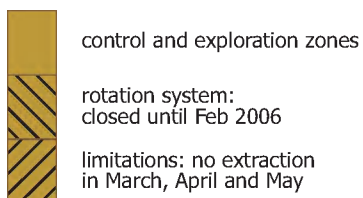


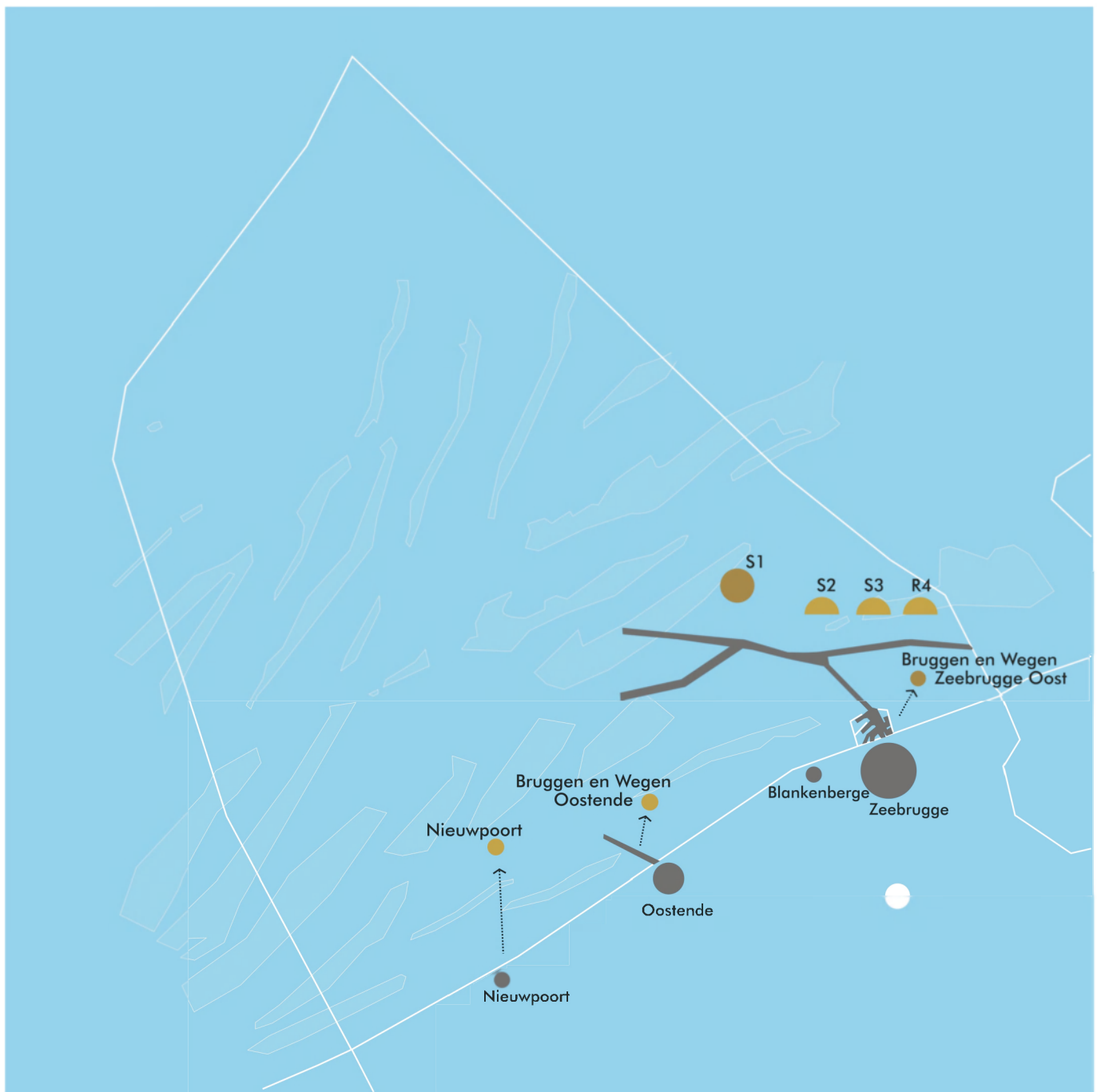


Map III.1.2.2f. Sand and gravel extraction in the BPNS (situation since 2004)

(Original data source: Federal Public Service Economy, SMEs, Self-employed and Energy / Original data source: Ministry of the Flemish Community, Department of Environment and Infrastructure, Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office;

Map: Maritime Institute - Gent University adapted from RCMG - Gent University)





Map III.1.2.2g. Dredging and dumping of dredge disposal in the BPNS

(Original data source: Ministry of the Flemish Community, Department of Environment and Infrastructure, Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office & Maritime Entrance Division / GEMS International nv / Data analysis: RCMG - Gent University; Map: Maritime Institute - Gent University adapted from RCMG - Gent University)

Dredged areas:

ports
(size of symbol in accordance with intensity of dredging)

channels

Sites for dredge disposal:

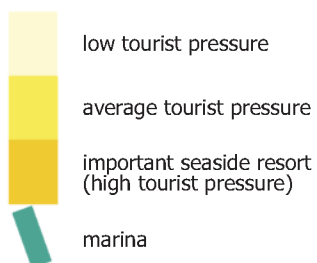
occasionally used sites

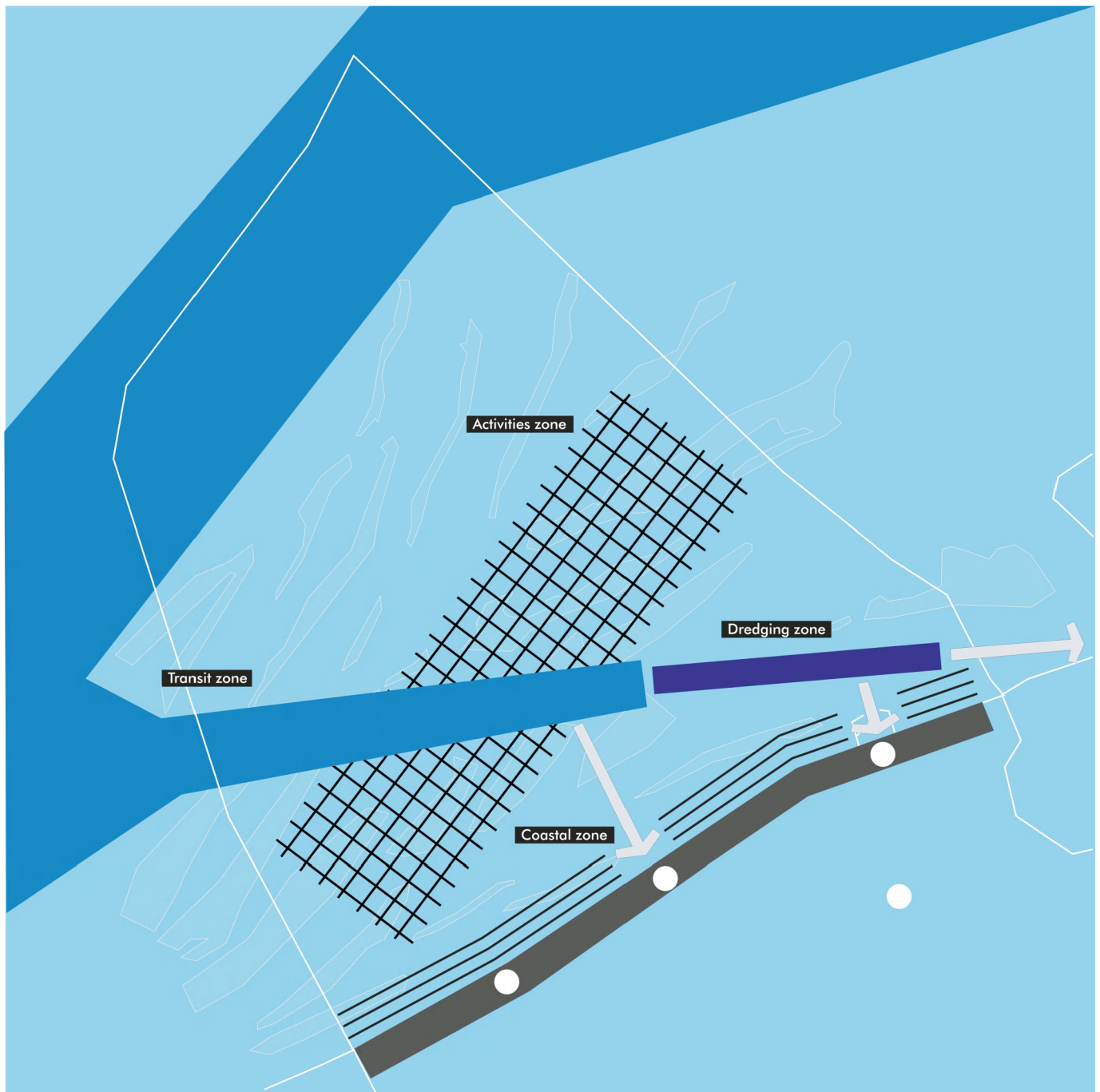
most intensively used sites
(S1 and 'Bruggen en Wegen Zeebrugge Oost')



Map III.1.2.2h. Tourism and recreation in the Belgian coastal strip

(Original data sources: Provincie West-Vlaanderen, Dienst Ruimtelijke Planning en Mobiliteit (2004) / Maes, F, Douvere, F, and Schrijvers, J. (MAREDASM), 2002/ WES consultancy, 2004;
Map: Maritime Institute - Gent University)



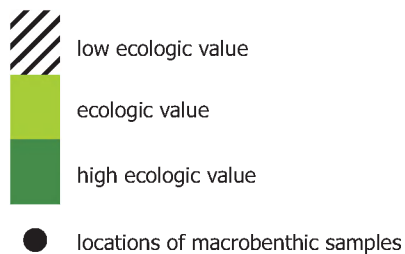


Map III.1.2.2i. Existing spatial structure: dynamics in the BPNS
(Structure map: Maritime Institute - Gent University)



Map III.1.2.3a. Primary ecological valorisation of the BPNS in overlay with locations of macrobenthic samples

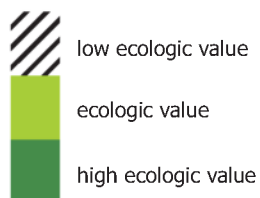
(Original data source: Marine Biology Section - Gent University; Data analysis: Marine Biology Section - Gent University; Map: Maritime Institute - Gent University)





Map III.1.2.3b. Primary ecological valorisation of the BPNS

(Original data source: Marine Biology Section - Gent University; Data analysis: Marine Biology Section - Gent University; Structure map: Maritime Institute - Gent University)





Map III.1.2.3c. Important locations for birds (seaside and landside)

(Original data source: www.gisvlaanderen.be/geo-vlaanderen/vogelatlas;

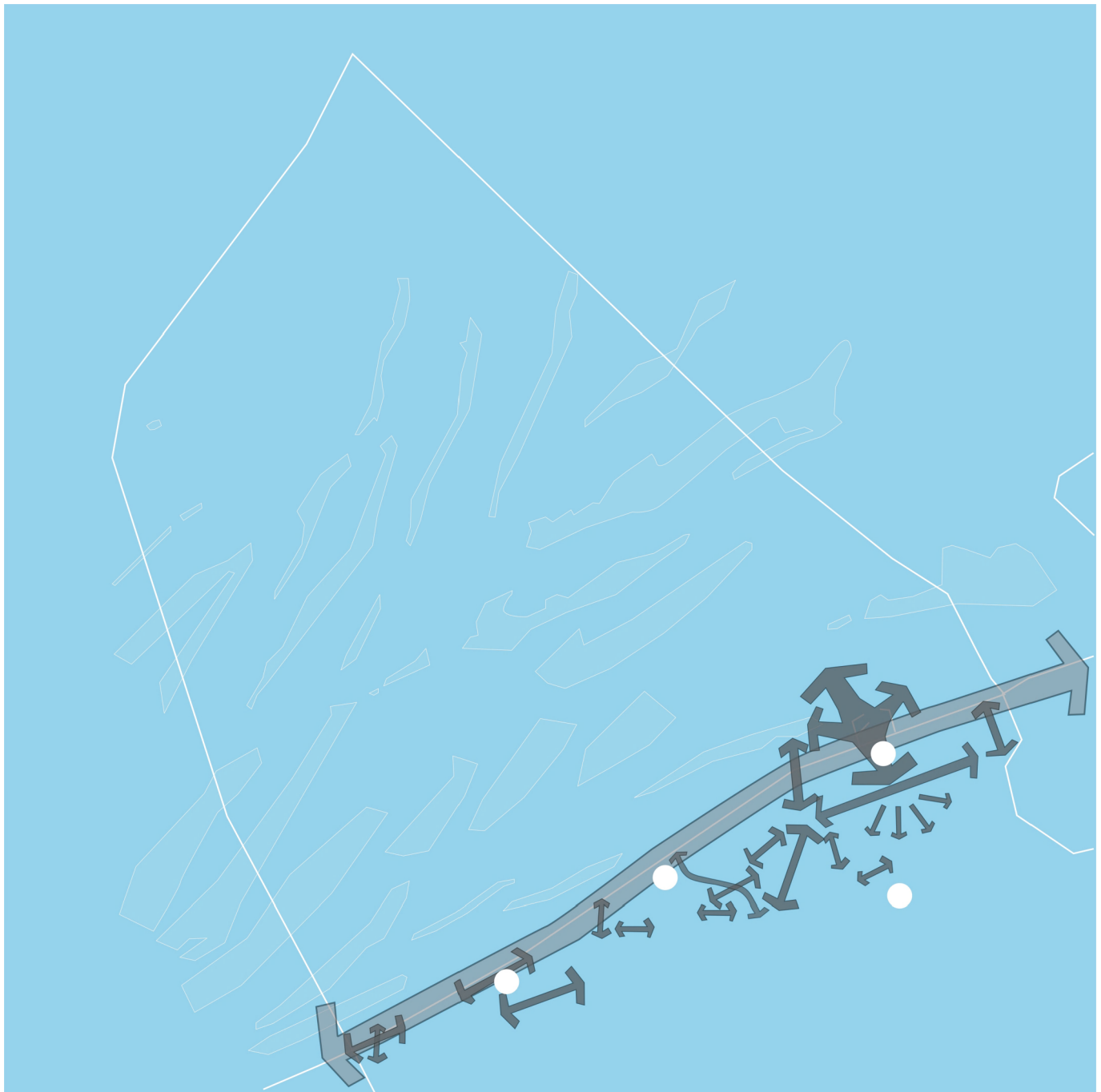
Map: Maritime Institute - Gent University)

Important locations for birds:

- areas with important breeding, stopping and/or sleeping grounds
- nesting ground

(Proposed) protected locations for birds:

- Bird Directive areas
- Ramsar areas (at sea: Kustbanken - Het Zwin)
- proposed Habitat Directive area



Map III.1.2.3d. Most important (known) bird routes in the Belgian coastal area

(Original data source: www.gisvlaanderen.be/geo-vlaanderen/vogelatlas;

Map: Maritime Institute - Gent University)

↔ seasonal migration

→ sleeping and feeding migration



Map III.1.2.3e. Existing spatial structure: natural values in the BPNS
 (Structure map: Maritime Institute - Gent University)

↔ high natural values parallel to the coastal strip




↔ natural relations between seaside and landside

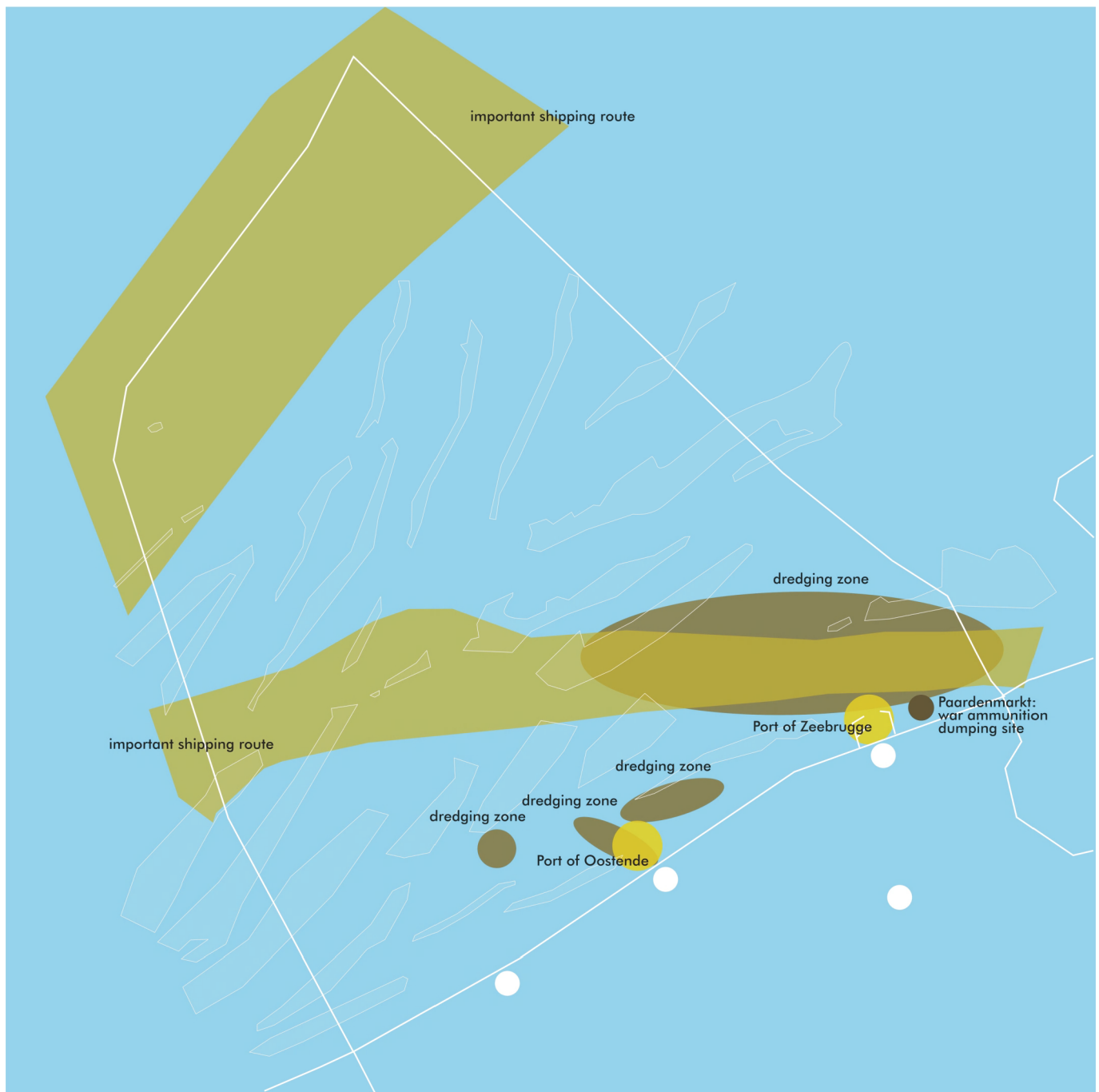


Map III.1.2.3f. Location of ship wrecks

(Original data source: Ministry of the Flemish Community, Department of Environment and Infrastructure, Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office, "Wrecks on the Belgian Continental Shelf adapted up to BAZ 2003/07" (3 June 2003);

Structure map: Maritime Institute - Gent University)

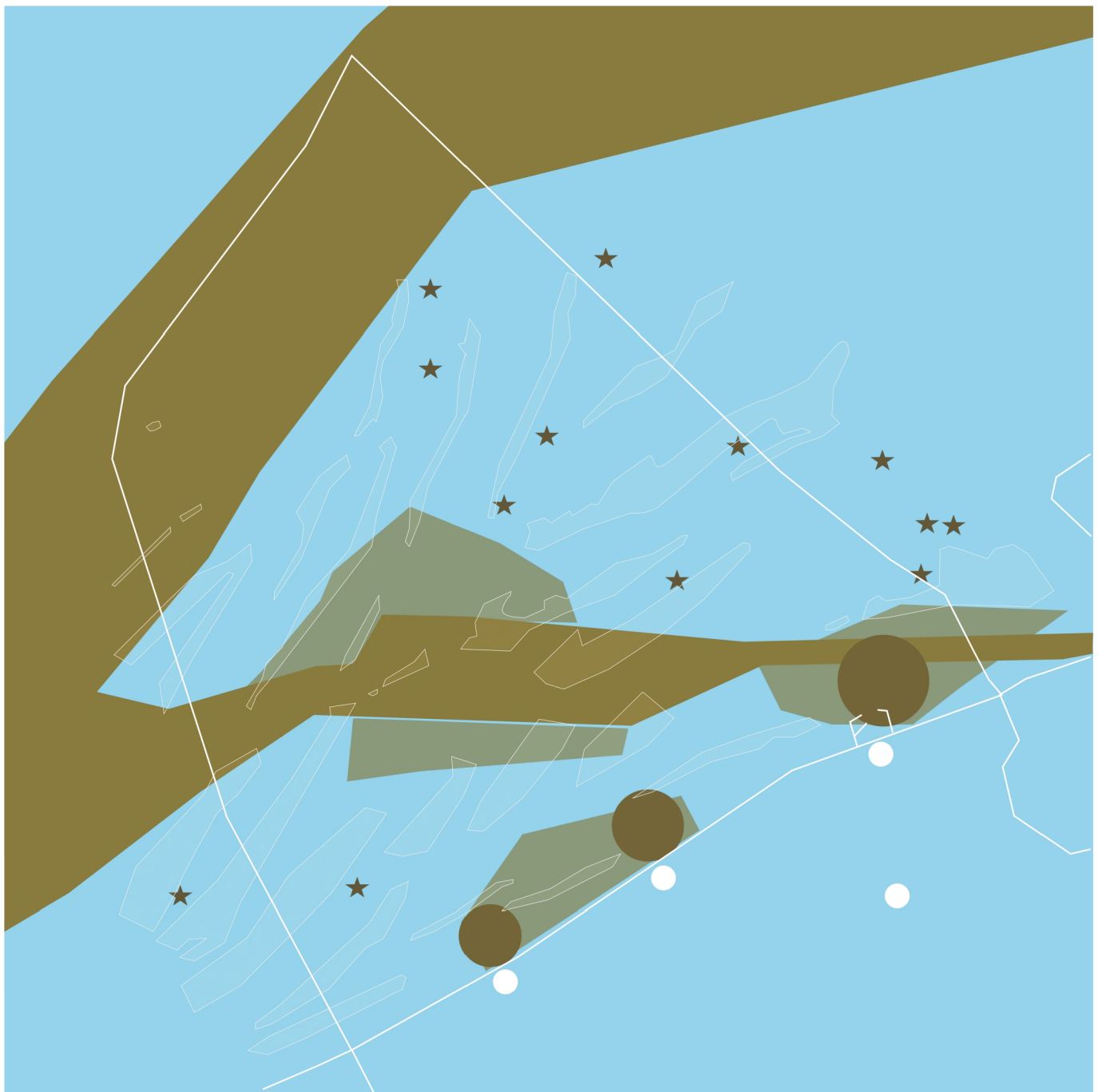
-  areas with a high concentration of ship wrecks
-  areas with a concentration of ship wrecks
-  solitary ship wrecks



Map III.1.2.3g. Pollution and disturbance of the seabed

(Structure map: Maritime Institute - Gent University, based on information from Chapter II.3 of this report)



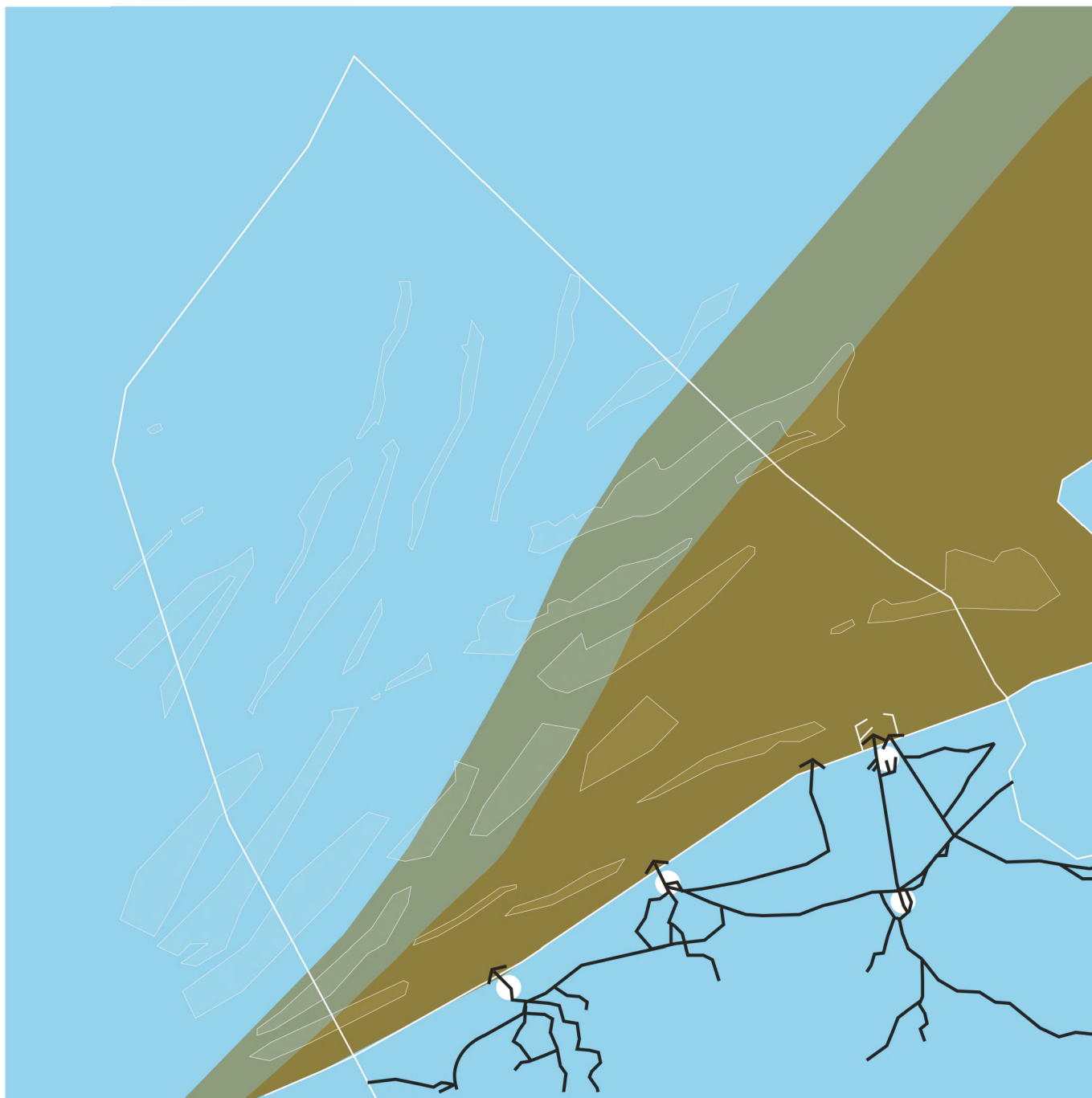


Map III.1.2.3h. Pollution and disturbance of the water column: oil pollution at sea, based on observations of oil slicks 1996-2002

(Original data: www.mumm.ac.be/EN/Monitoring/Aircraft/results.php;

Map: Maritime Institute - Gent University)

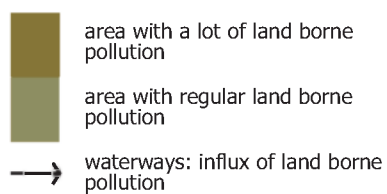
- area with frequent oil slicks
- area with less frequent oil slicks
- port (frequent oil pollution)
- occasional oil slicks

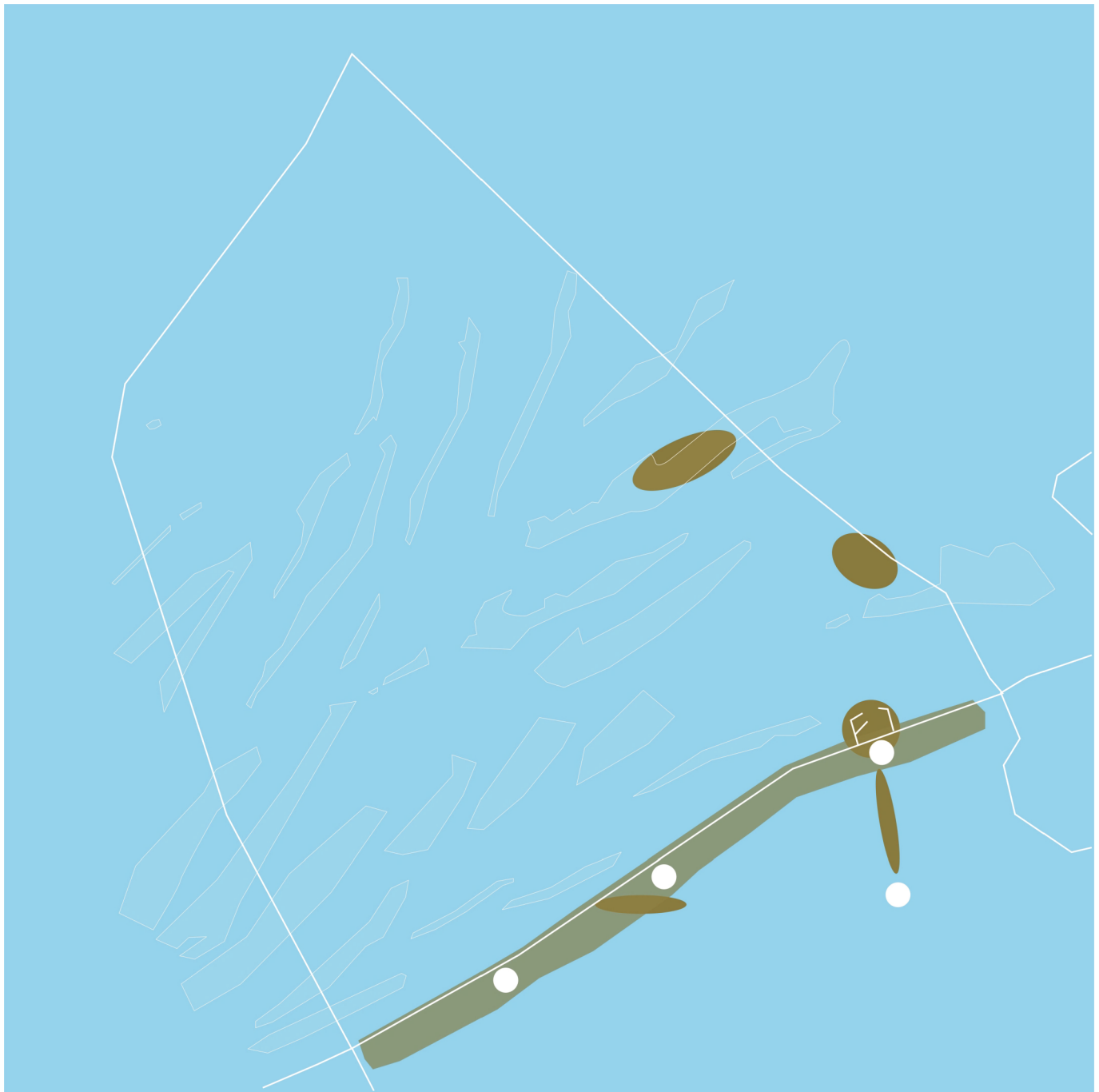


Map III.1.2.3i. Pollution and disturbance of the water column: land borne pollution, based on observations

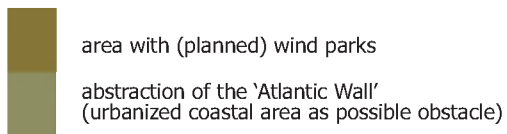
(Original data: www.mumm.ac.be/EN/Models/Development/Ecosystem/how.php#nitrates;

Map: Maritime Institute - Gent University)





Map III.1.2.3j. Aerial disturbance: (future) potential obstacles for birds above the BPNS
(Map: Maritime Institute - Gent University, based on information from Chapter II.3 of this report)







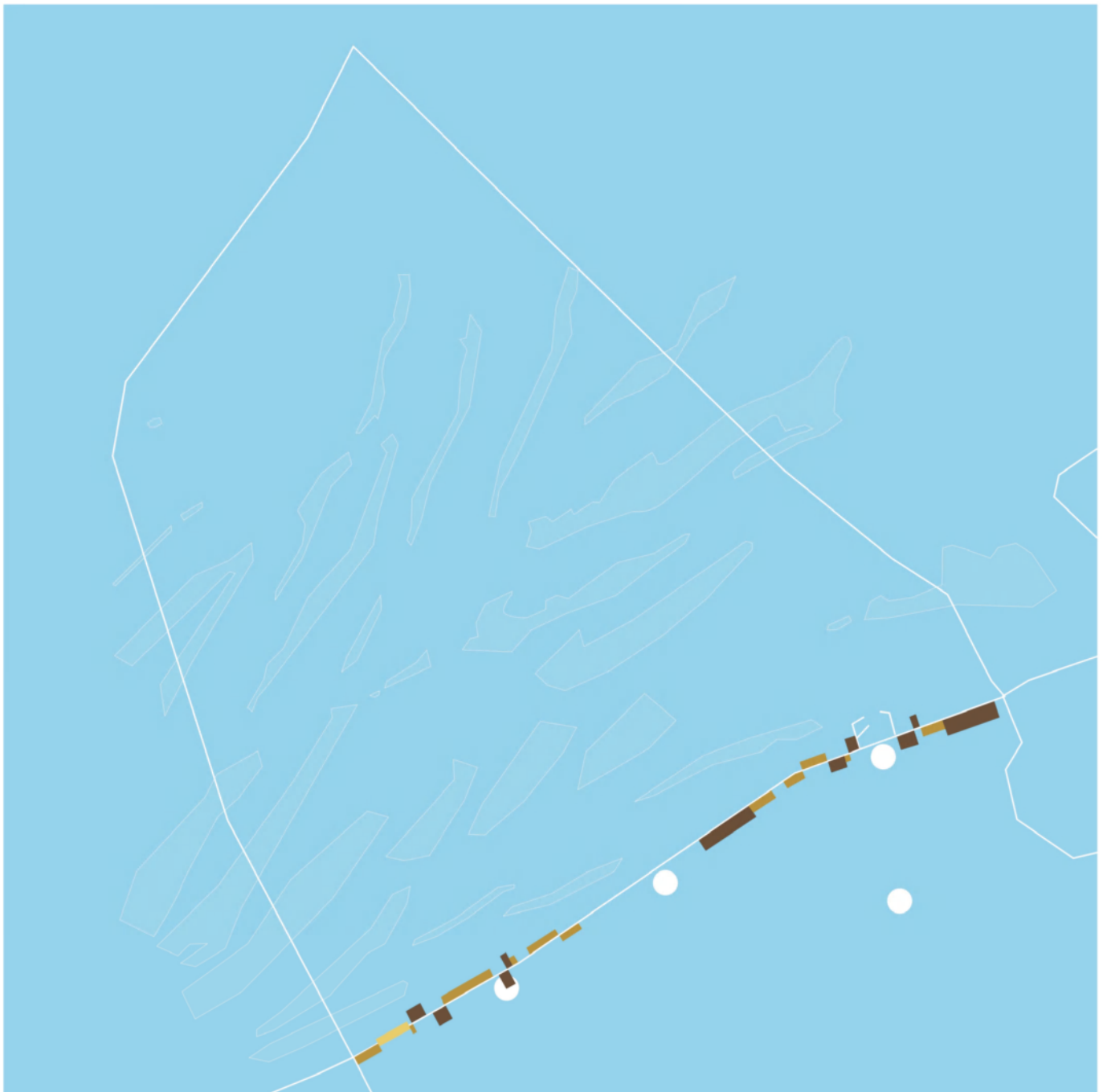


Map III.1.2.4a. Planned wind turbine parks in the BPNS

(Original data source: C-Power nv / TV Electrabel - Ondernemingen Jan de Nul (Project Seanergy);

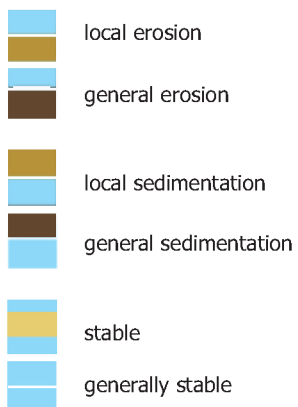
Map: Maritime Institute - Gent University adapted from RCMG - Gent University)

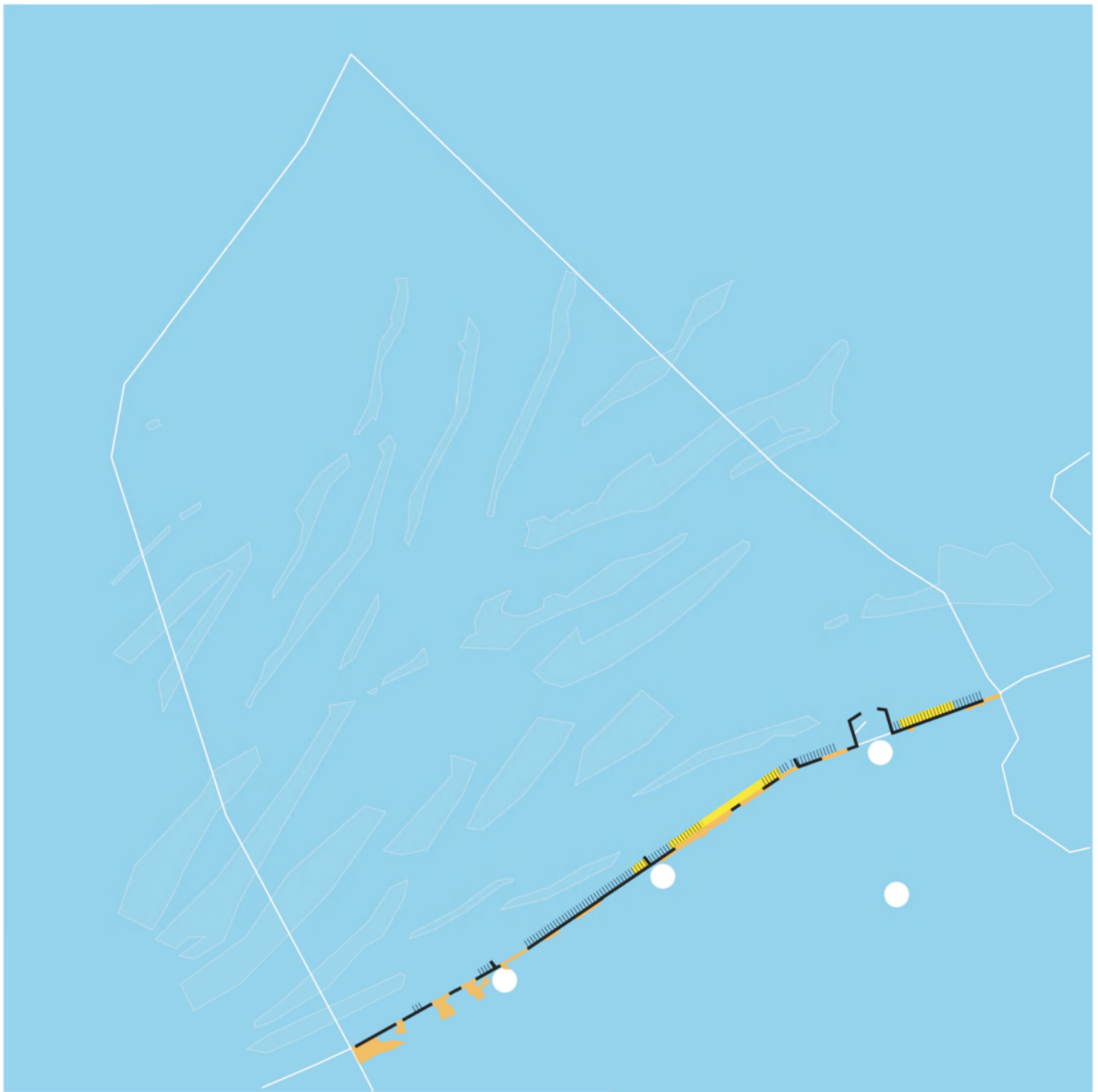
-  planned wind turbine park
Electrabel - Jan de Nul I (license suspended)
-  planned wind turbine park (+ electricity cable)
C-Power II
-  high-voltage cable on land
-  planned high-voltage cable
on land



Map III.1.2.4b. Coastal defense in the BPNS: evolution of the coastline

(Map: Maritime Institute - Gent University adapted from Belpaeme & Konings (eds.) (2004) The Coastal Atlas Flanders-Belgium. Coordination Center for ICZM, Oostende, Belgium)

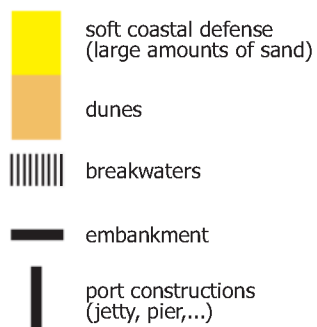


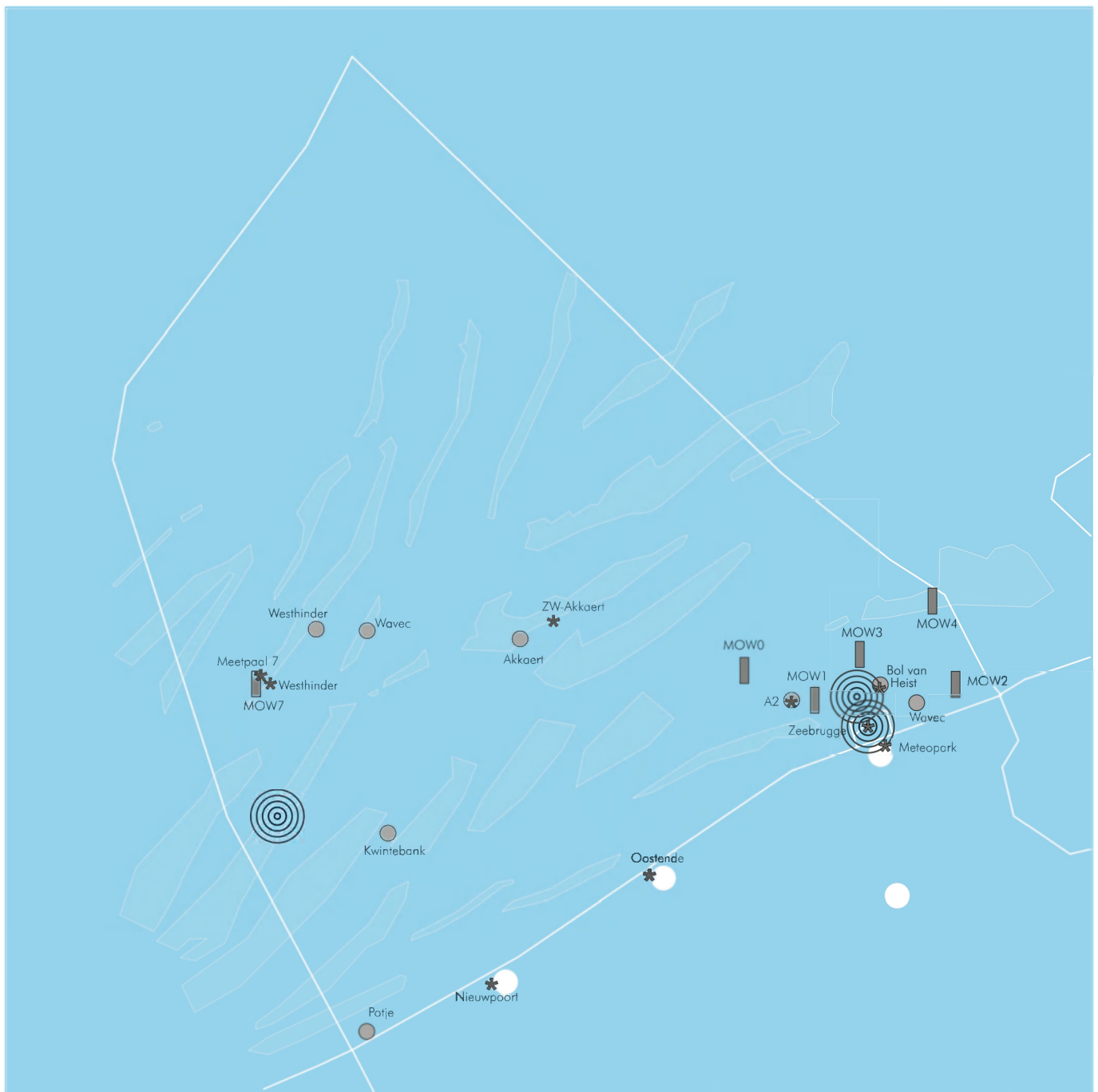


Map III.1.2.4c. Coastal defense in the BPNS

(Original data source: Anoniem, 1998. Kustlijnkaarten. Evolutie tot mei 1999. Deel1: Franse grens tot Oostende en deel 2: Oostende tot Cadzand, door de N.V. Eurosense in opdracht van AWZ afdeling Waterwegen Kust. Ministerie van de Vlaamse Gemeenschap; Data analysis: RCMG - Gent University;

Map: Maritime Institute - Gent University, adapted from RCMG - Gent University)









Map III.1.2.4d. Radar, survey and monitoring infrastructure in the BPNS

(Original data source: Ministry of the Flemish Community, Department of Environment and Infrastructure, Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office & Hydrometeo, "Overview of positions (WGS84) weather masts and radar mast Oost Dyck on nautical maps";

Map: Maritime Institute - Gent University adapted from RCMG - Gent University)

-  survey platform
-  Wavec / Waverider
-  survey point
-  radar mast



Map III.1.2.4e. Cables and pipelines in the BPNS: all cables and pipelines (left) and the main bundles (right)

(Original data source: Federal Public Service Economy, SMEs, Self-employed and Energy / Ministry of the Flemish Community, Department of Environment and Infrastructure, Waterways and Marine Affairs Administration, Division Coast, Hydrographic Office;

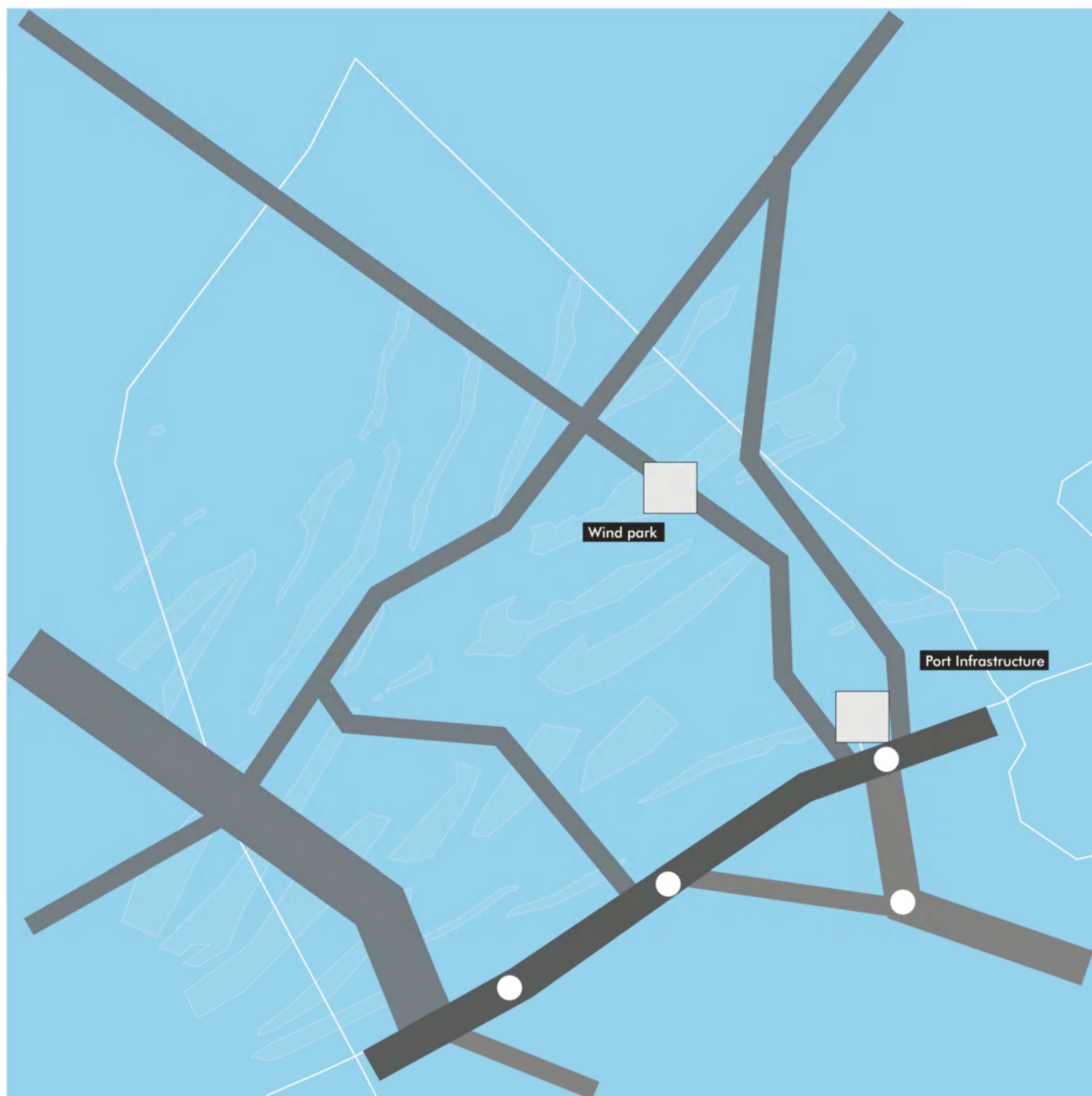
Data analysis: RCMG - Gent University;

Map: Maritime Institute - Gent University adapted from RCMG - Gent University)




— bundles of cables and pipelines

— solitary cables

- - - cables in disuse

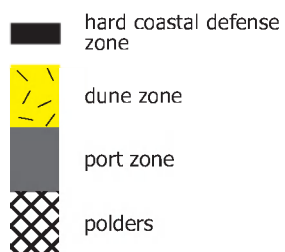


Map III.1.2.4f. Existing spatial structure: fixed infrastructure in the BPNS
 (Structure map: Maritime Institute - Gent University)

-  bundles of cables and pipelines
-  the coastal strip: urbanisation (tramway, roads) parallel to the coastline and coastal defense
-  (planned) wind turbine park



Map III.1.2.5a. Existing spatial structure of the Belgian coastal strip
 (Structure map: Maritime Institute - Gent University)



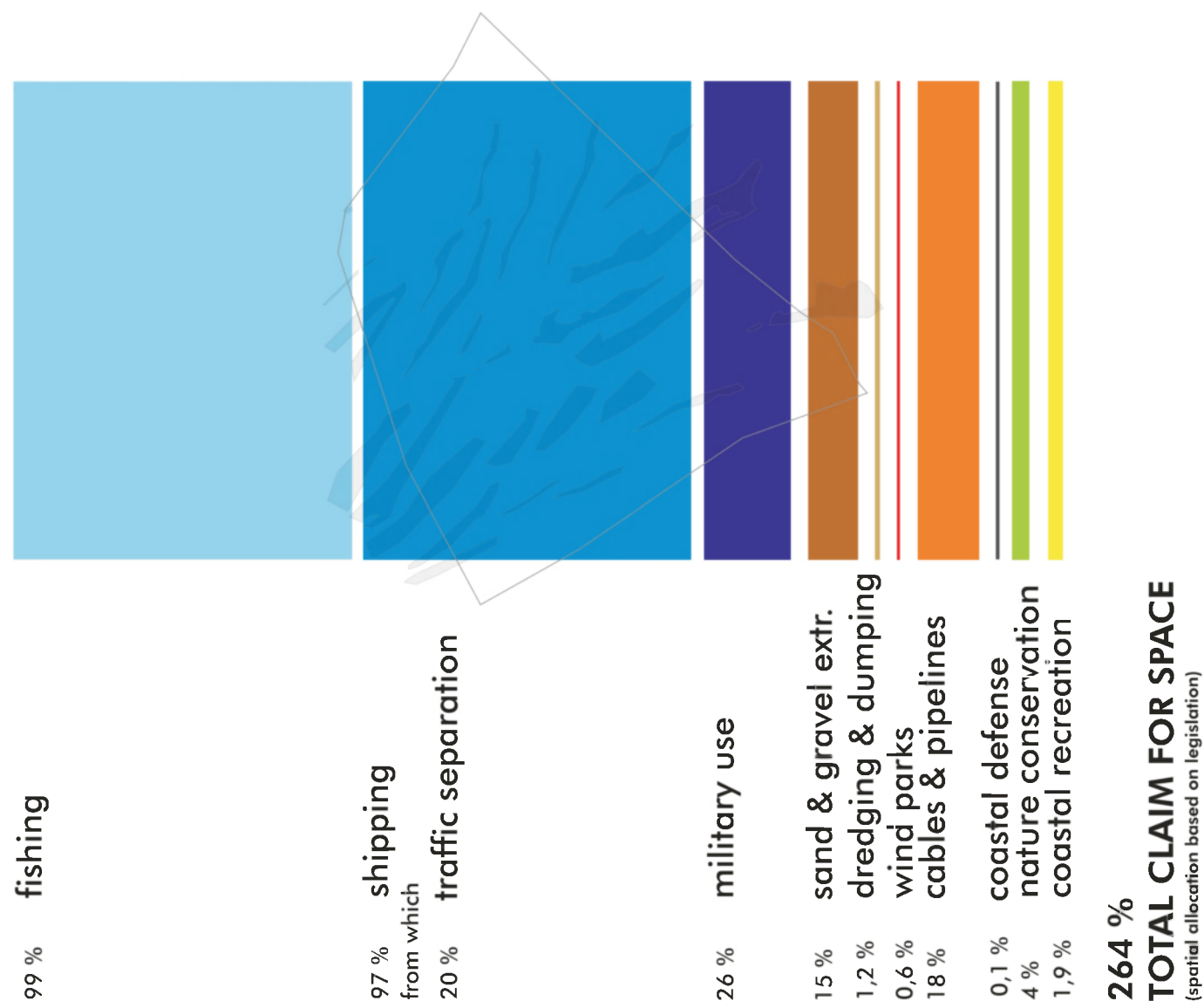


Figure III.1.4.1a. Demand for space in the BPNS, based on legislation and on the condition that all space would be both available and suitable (abstract and simplified scheme)
 (Maritime Institute - Gent University)

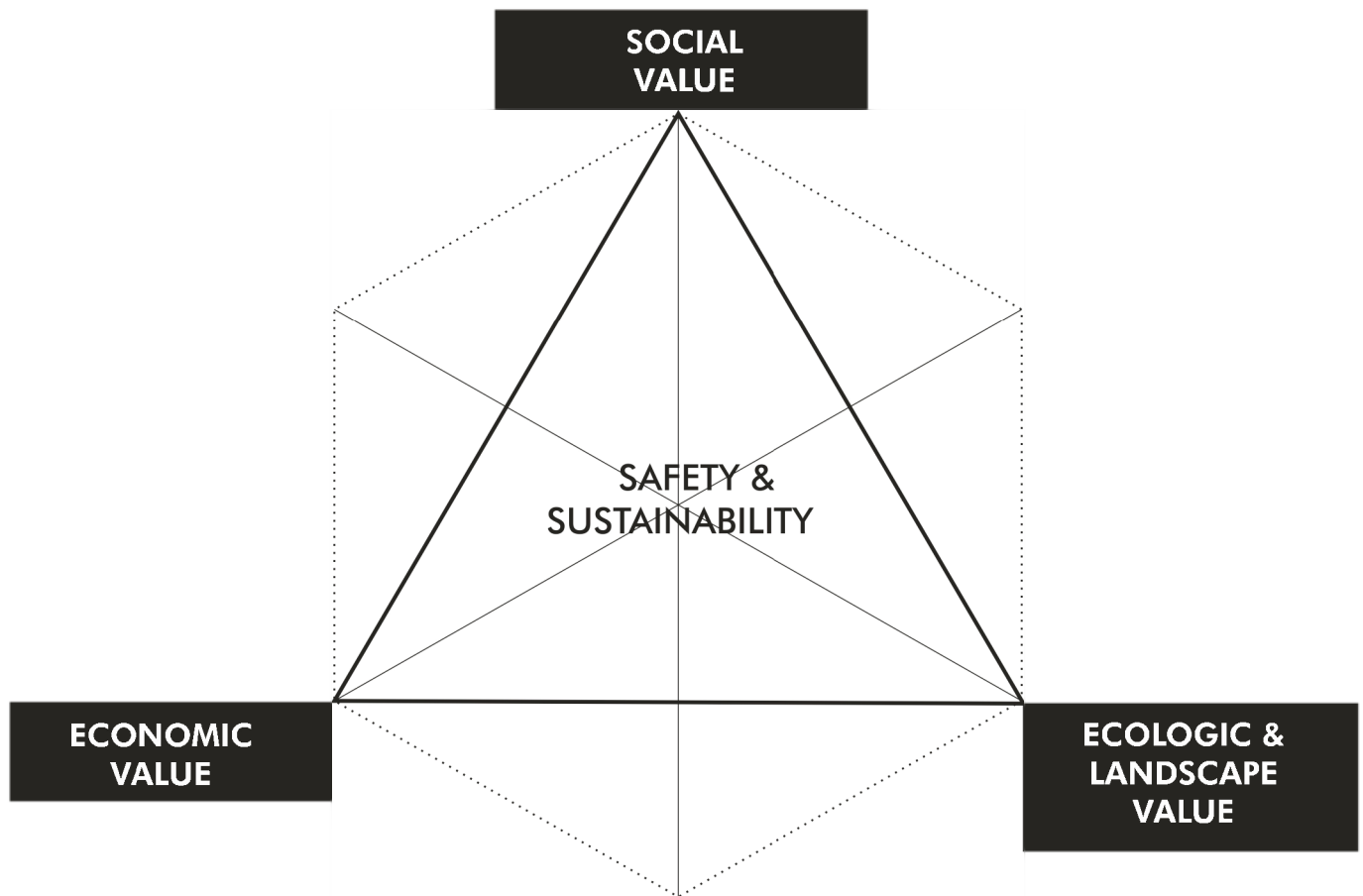


Figure III.1.4.2a. Developing scenarios based on the three core values and relation with the values of safety and sustainability
(Maritime Institute - Gent University)

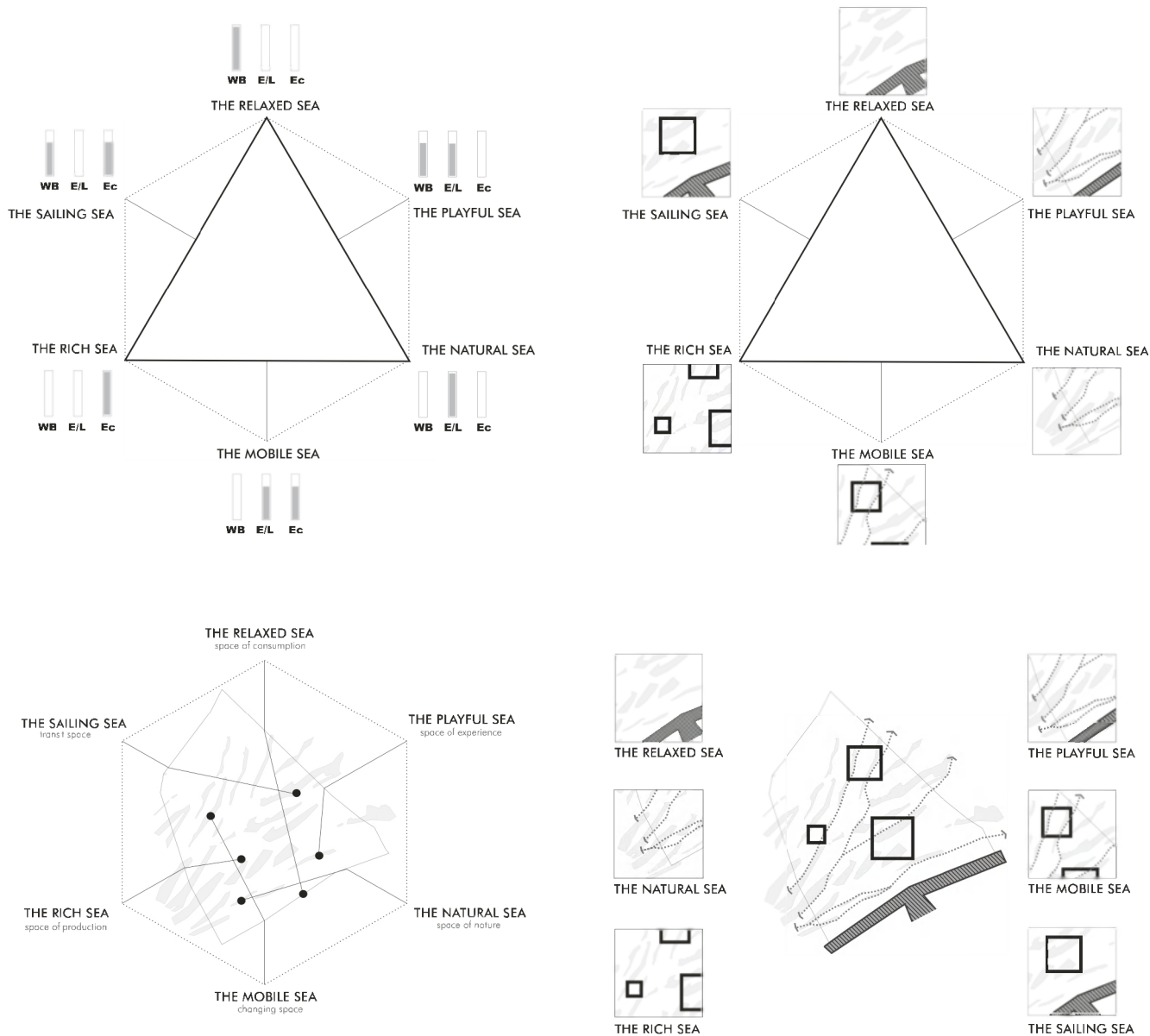


Figure III.1.4.2b. Developing six scenarios for the future of the BPNS
(Maritime Institute - Gent University)

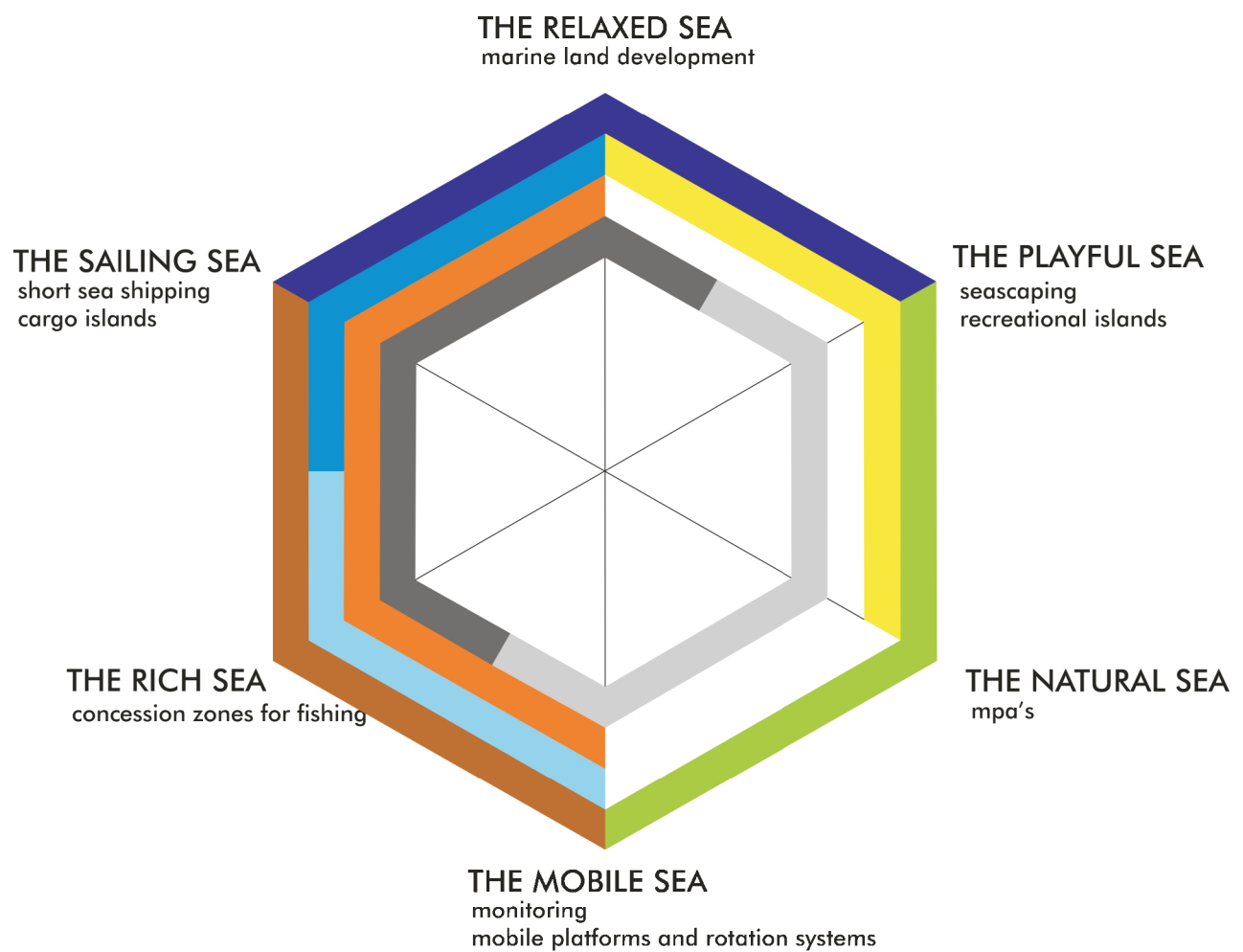
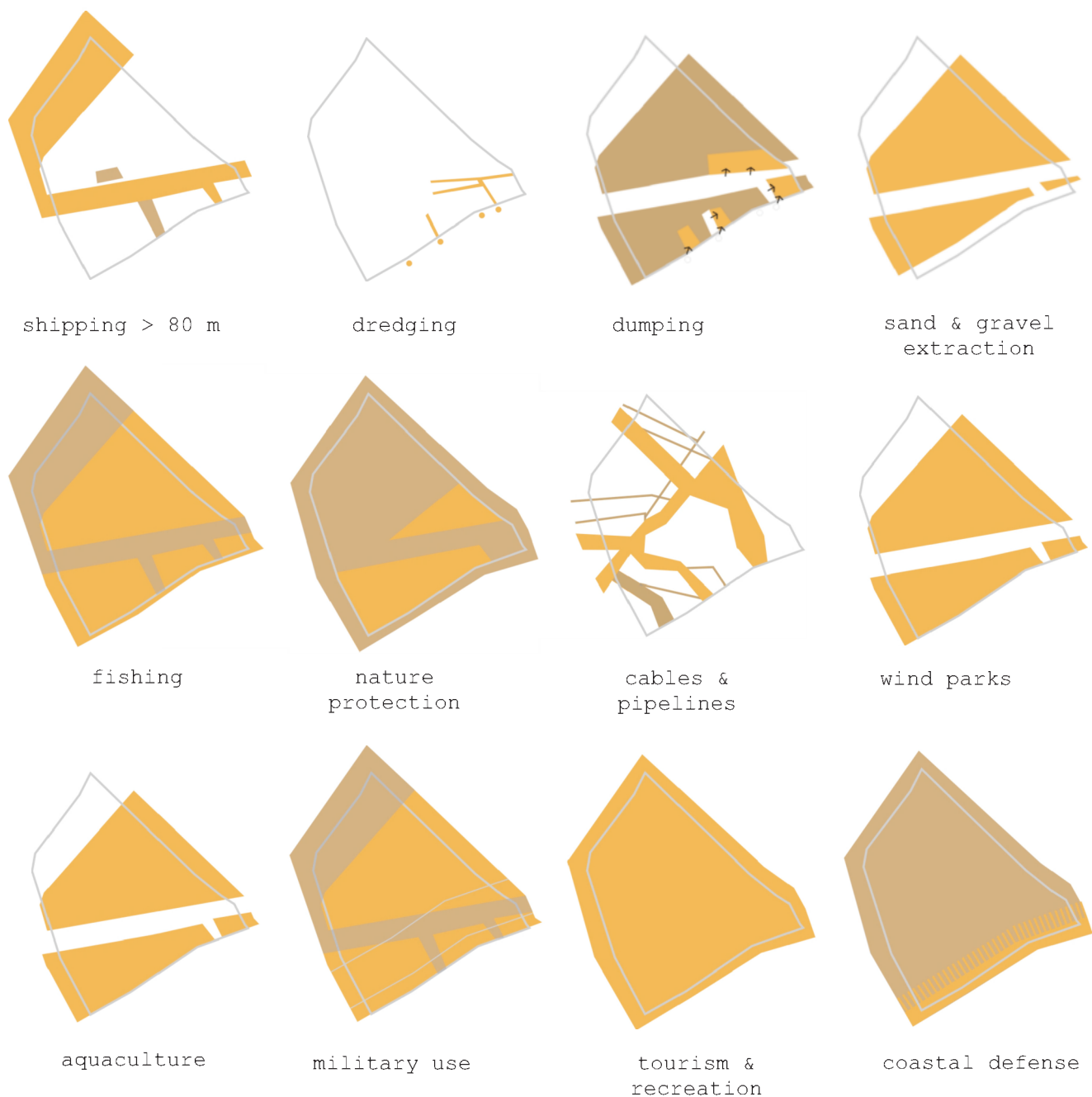
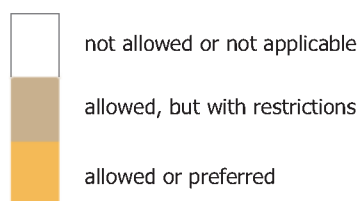
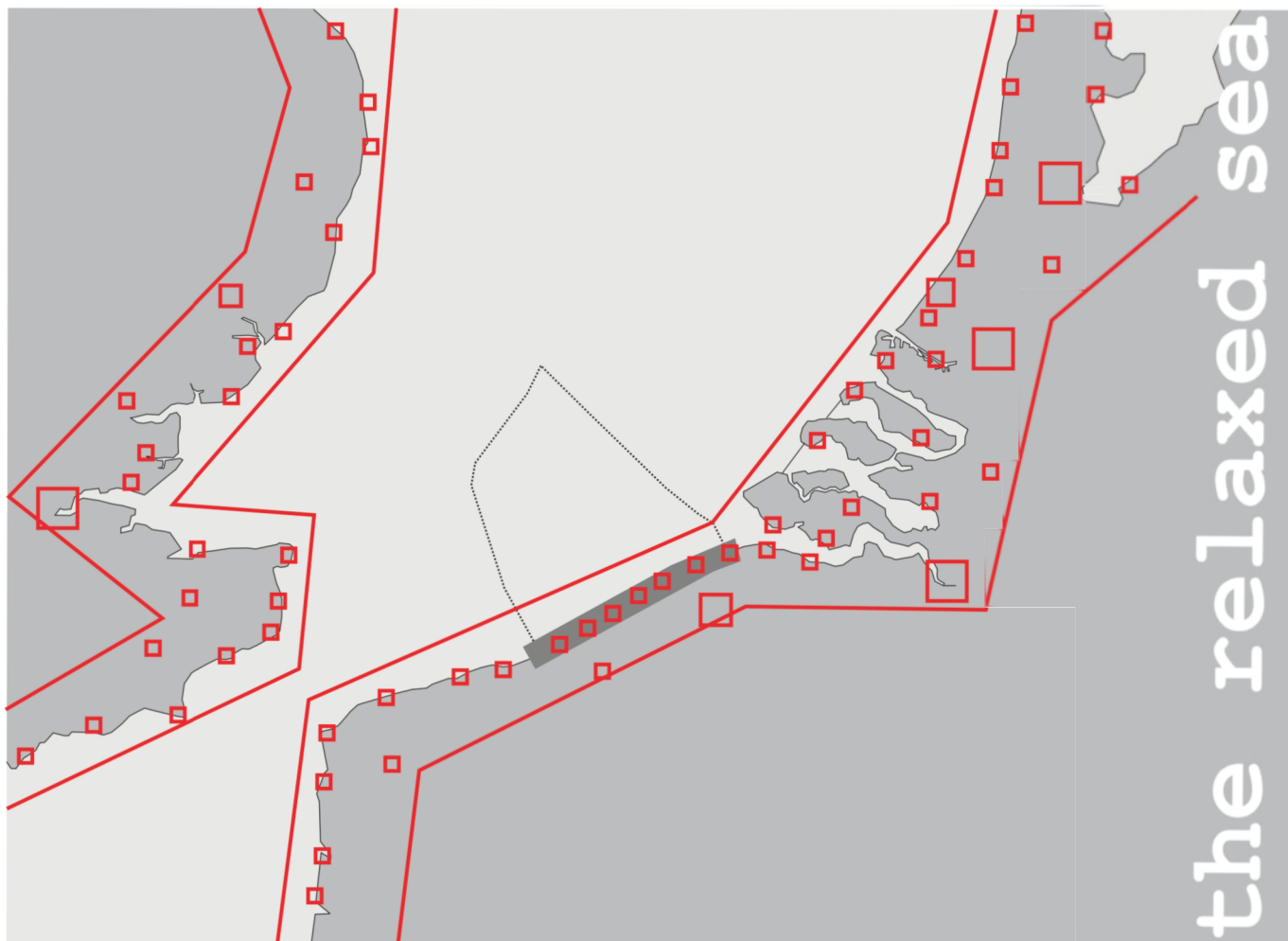


Figure III.1.4.2c. Six scenarios for the future of the BPNS
(Maritime Institute - Gent University)



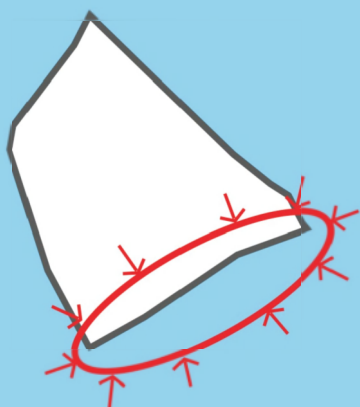
Map III.1.4.2a. General decision rules applicable to the six scenarios
 (Maps: Maritime Institute - Gent University)



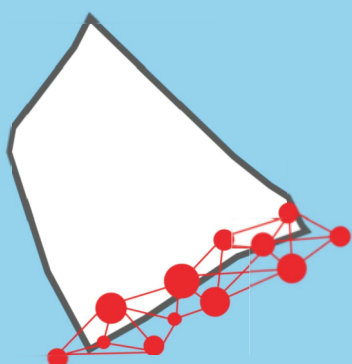


Map III.1.4.2b. Scenario 1: The Relaxed Sea - the broader context
(Structure map: Maritime Institute - Gent University)

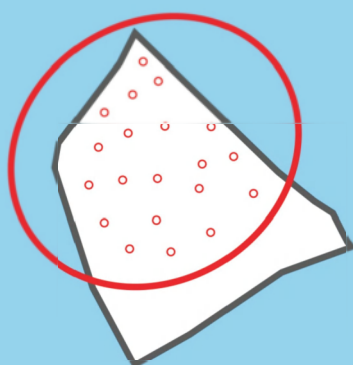
the relaxed sea



concentration and intensification
of activities in the coastal
area (seaside and landside)

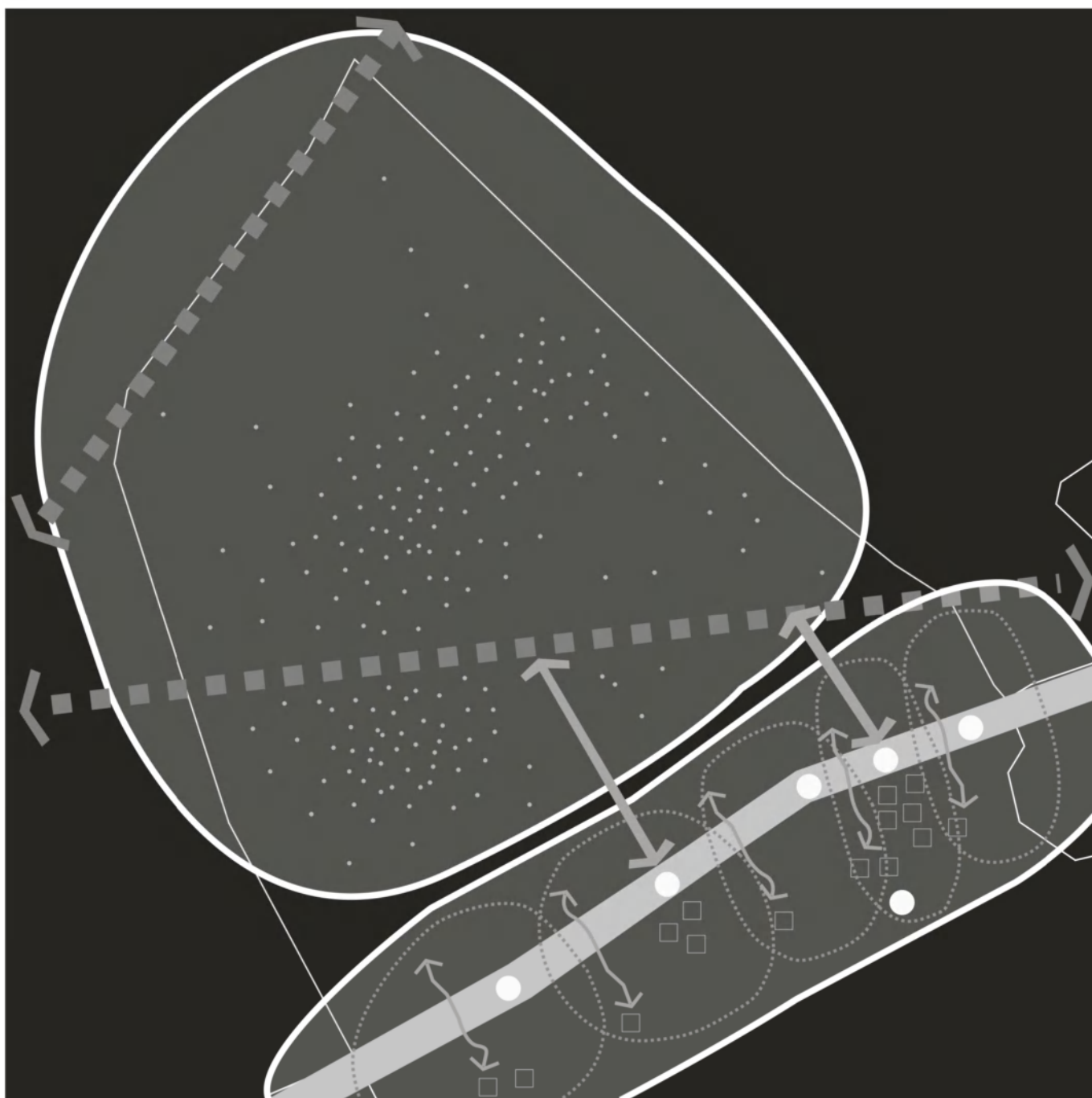


coastal area as a network of
complementary activities
(tourism - marine land
development - ...)

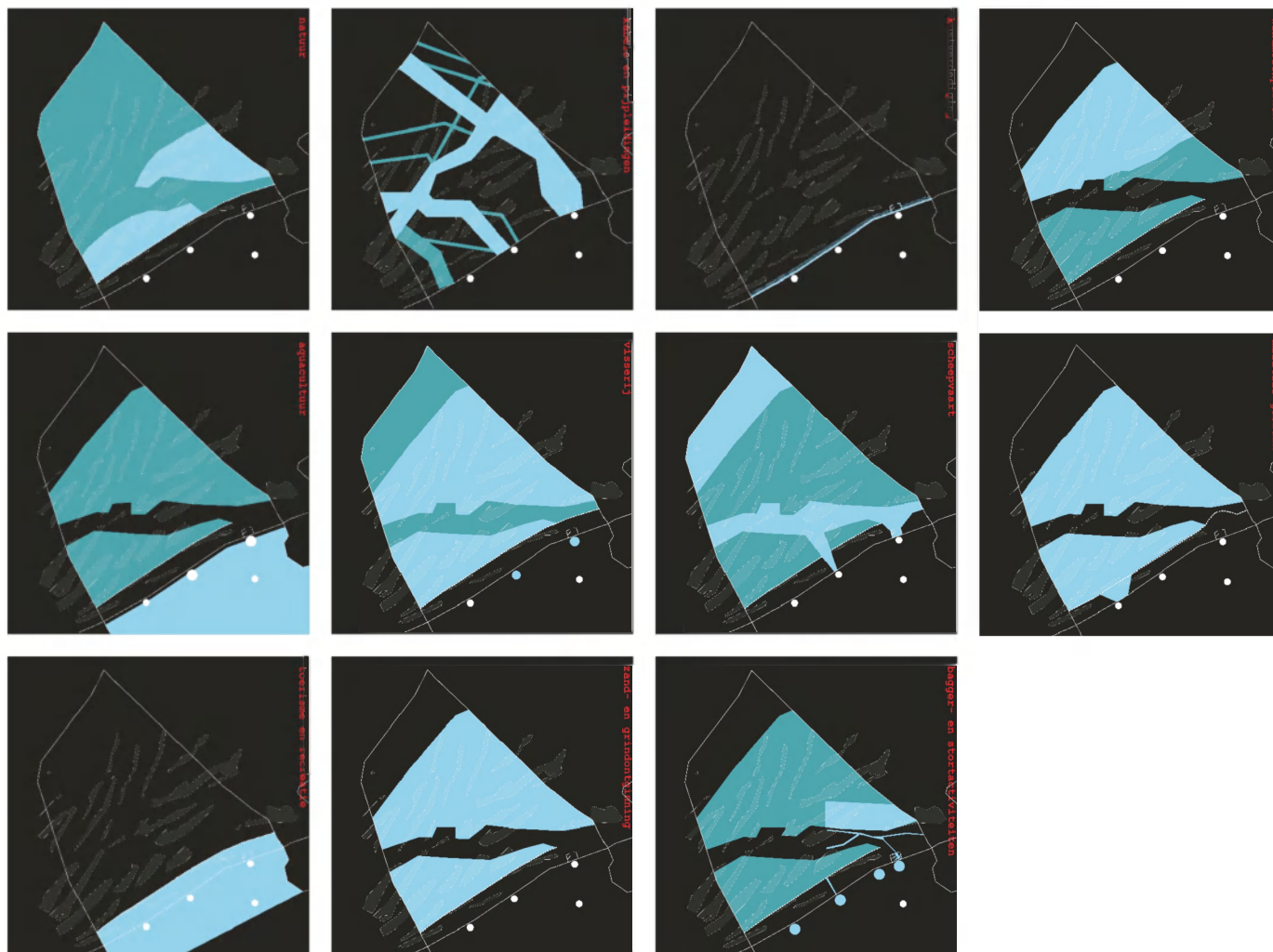


activities that cause disturbance
to tourism and recreation
are located in the deep sea

Map III.1.4.2c. Scenario 1: The Relaxed Sea - spatial concepts
(Structure maps: Maritime Institute - Gent University)



Map III.1.4.2d. Scenario 1: The Relaxed Sea - spatial structure plan
(Structure map: Maritime Institute - Gent University)



Map III.1.4.2e. Scenario 1: The Relaxed Sea - significance for the “uses” of the BPNS

left to right:

top row: nature conservation - cables & pipelines - coastal defense - wind parks

second row: aquaculture - fishing - shipping - military use

last row: tourism & recreation - sand & gravel extraction - dredging & dumping of dredgings

(Structure maps: Maritime Institute - Gent University)

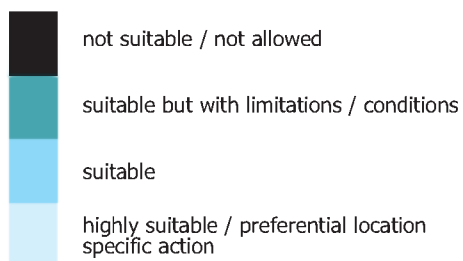
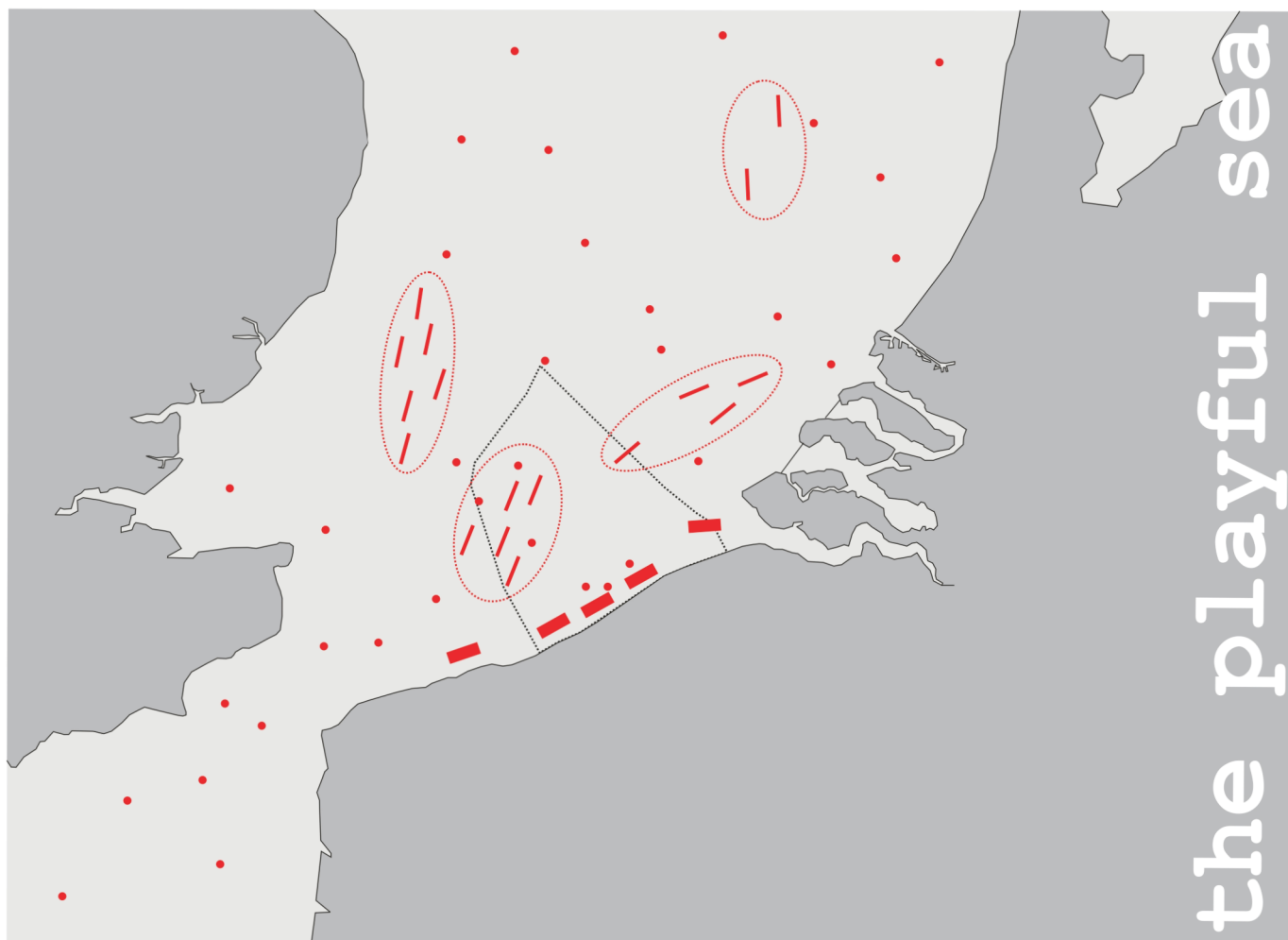


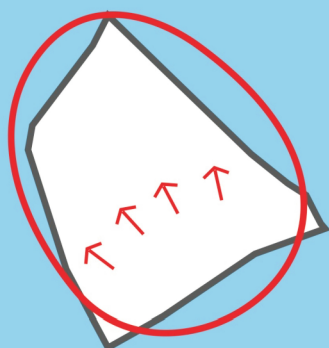


Figure III.1.4.2d. Scenario 1: The Relaxed Sea - atmospheric image
 (Maritime Institute - Gent University)



Map III.1.4.2f. Scenario 2: The Playful Sea - the broader context
(Structure map: Maritime Institute - Gent University)

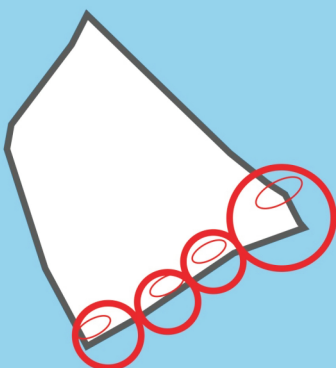
the playful sea



the whole North Sea
as experience

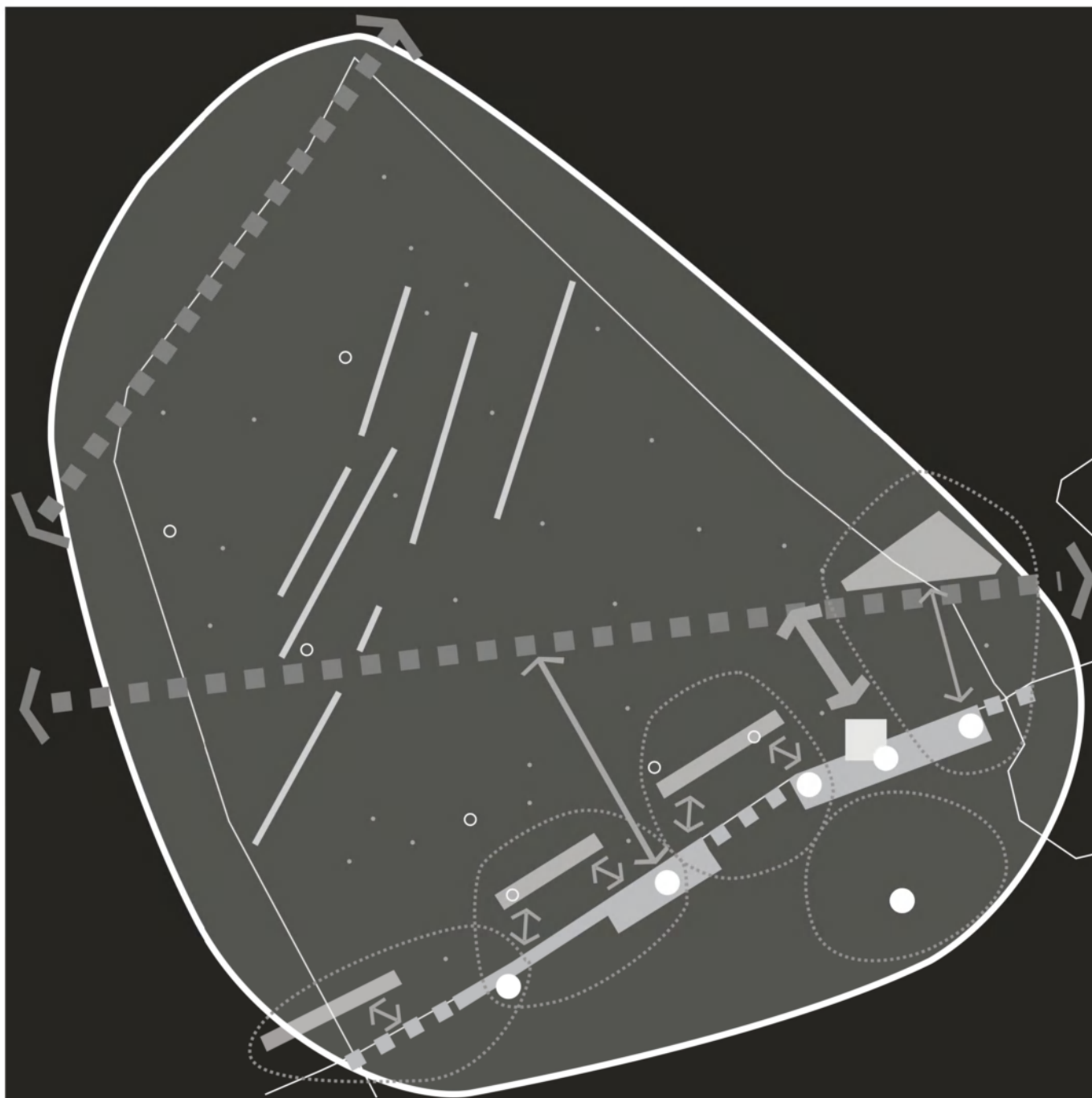


making the landscape of the
sea visible

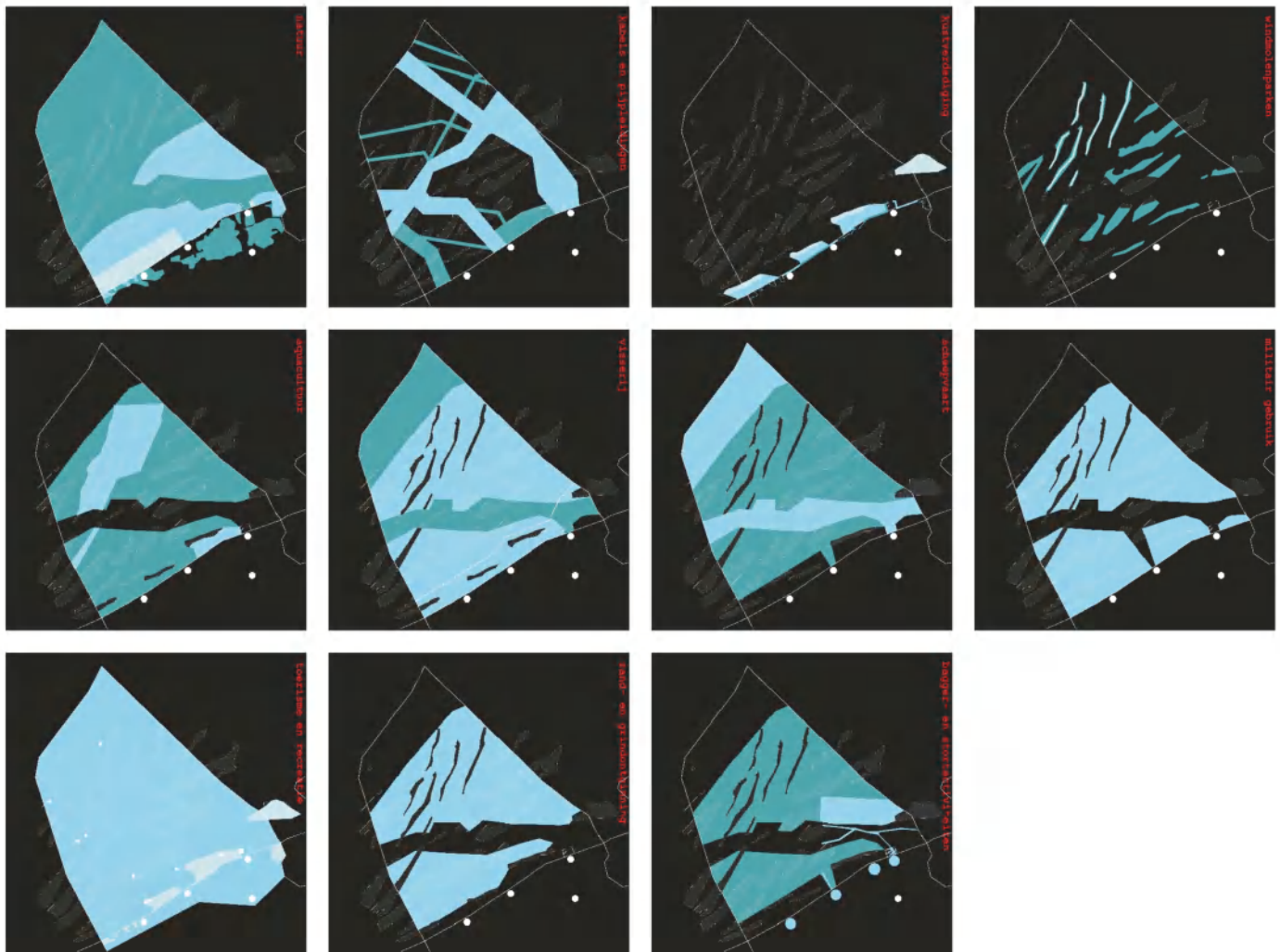


coastal islands render
a new, typical profile
to the Belgian coast

Map III.1.4.2g. Scenario 2: The Playful Sea - spatial concepts
(Structure maps: Maritime Institute - Gent University)



Map III.1.4.2h. Scenario 2: The Playful Sea - spatial structure plan
(Structure map: Maritime Institute - Gent University)



Map III.1.4.2i. Scenario 2: The Playful Sea - significance for the “uses” of the BPNS

left to right:

top row: nature conservation - cables & pipelines - coastal defense - wind parks

second row: aquaculture - fishing - shipping - military use

last row: tourism & recreation - sand & gravel extraction - dredging & dumping of dredgings

(Structure maps: Maritime Institute - Gent University)

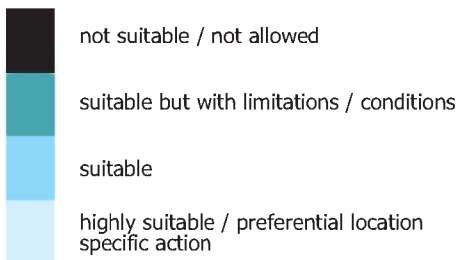
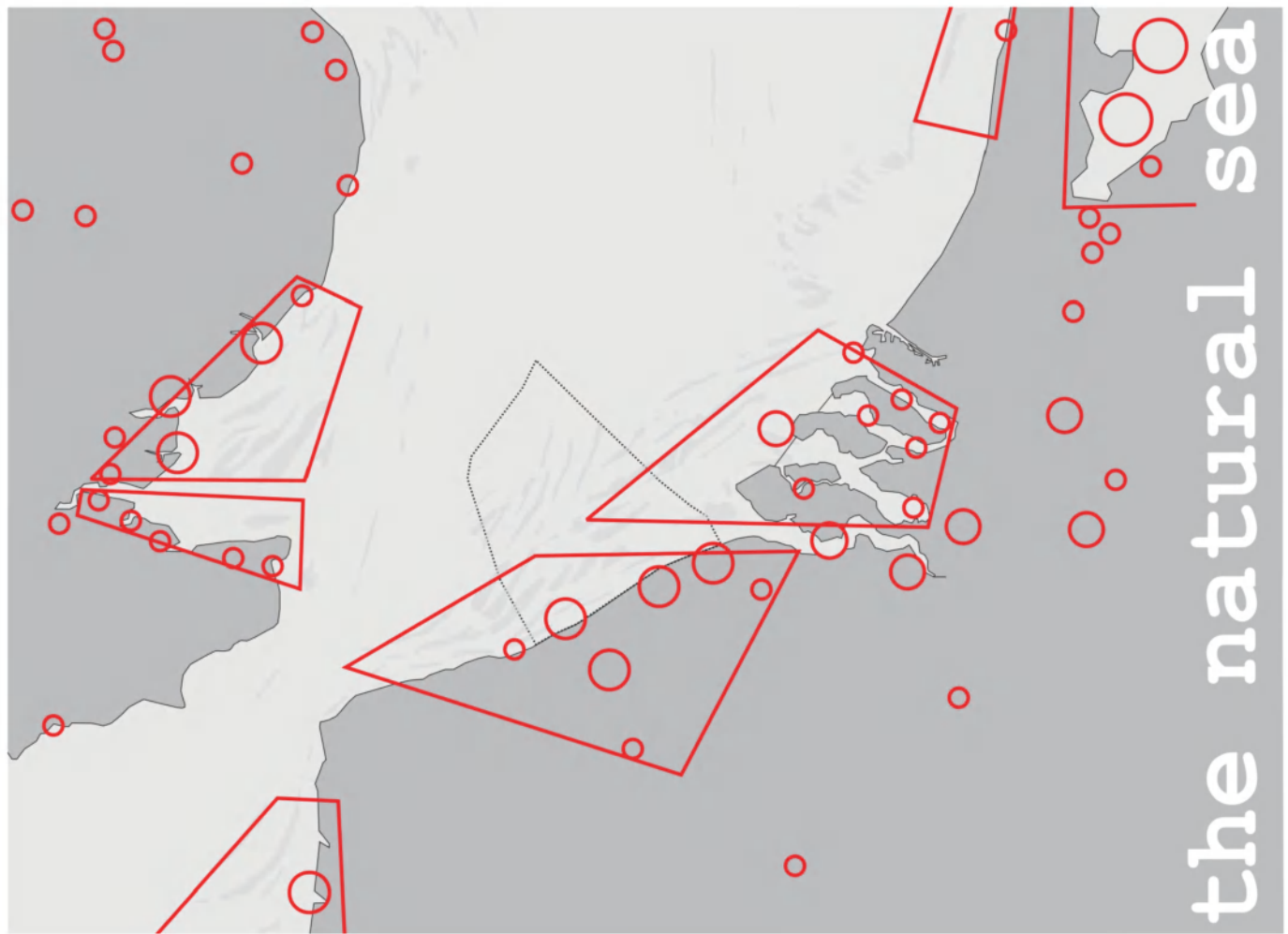


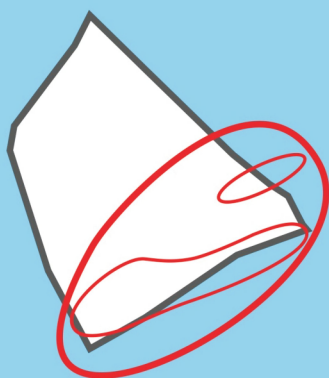


Figure III.1.4.2e. Scenario 2: The Playful Sea - atmospheric image
(Maritime Institute - Gent University)

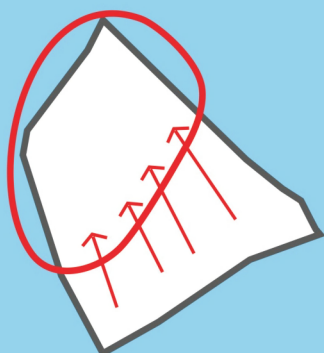


Map III.1.4.2j. Scenario 3: The Natural Sea - the broader context
(Structure map: Maritime Institute - Gent University)

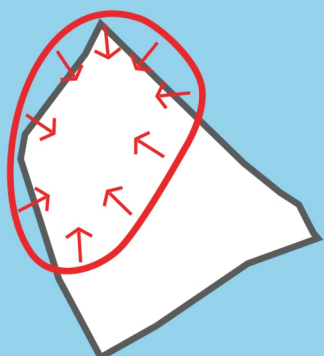
the natural sea



protecting the natural wealth of the shallow coastal area and coastal polders (marine protected areas)

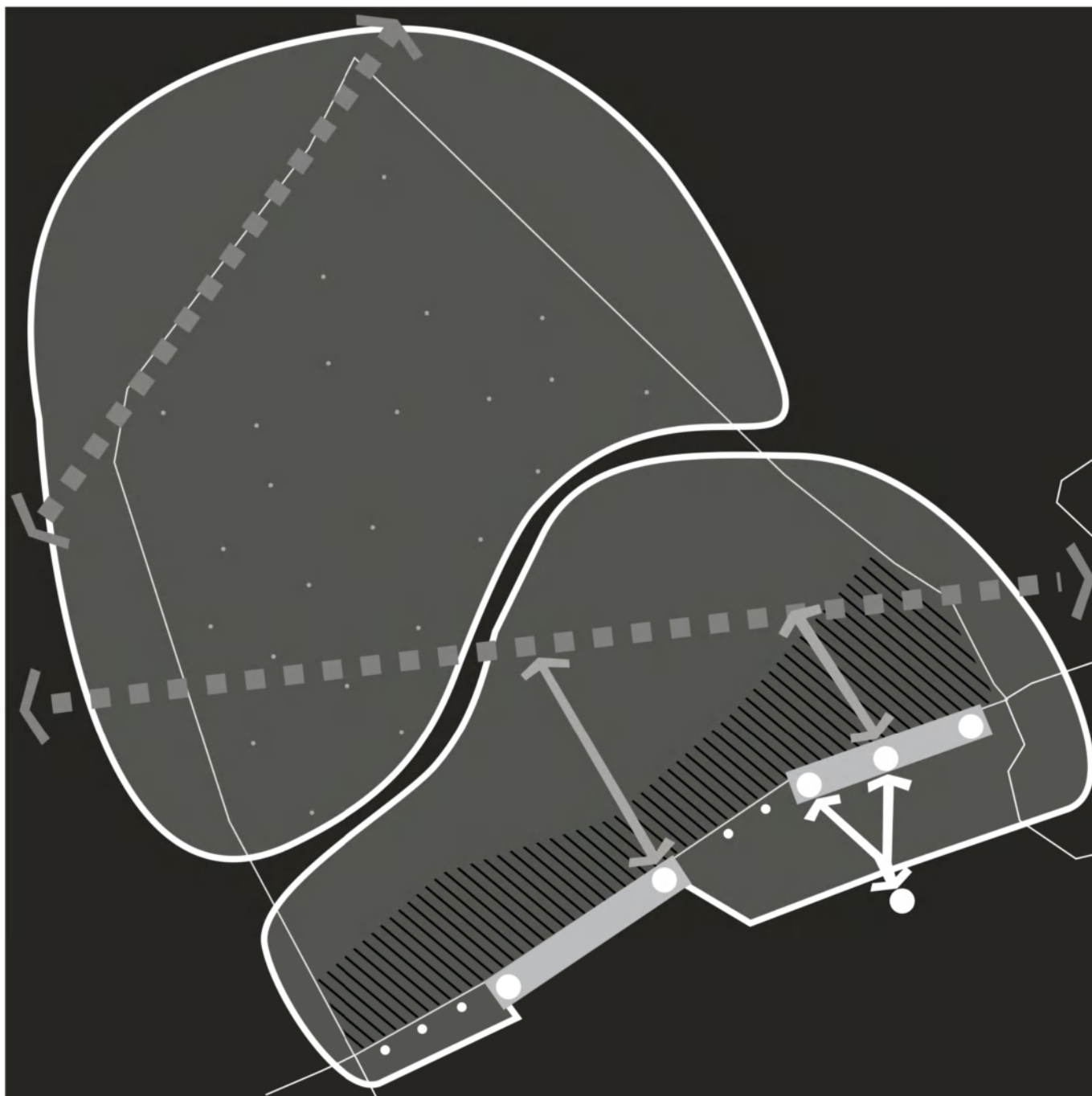


relocating activities to the deep sea

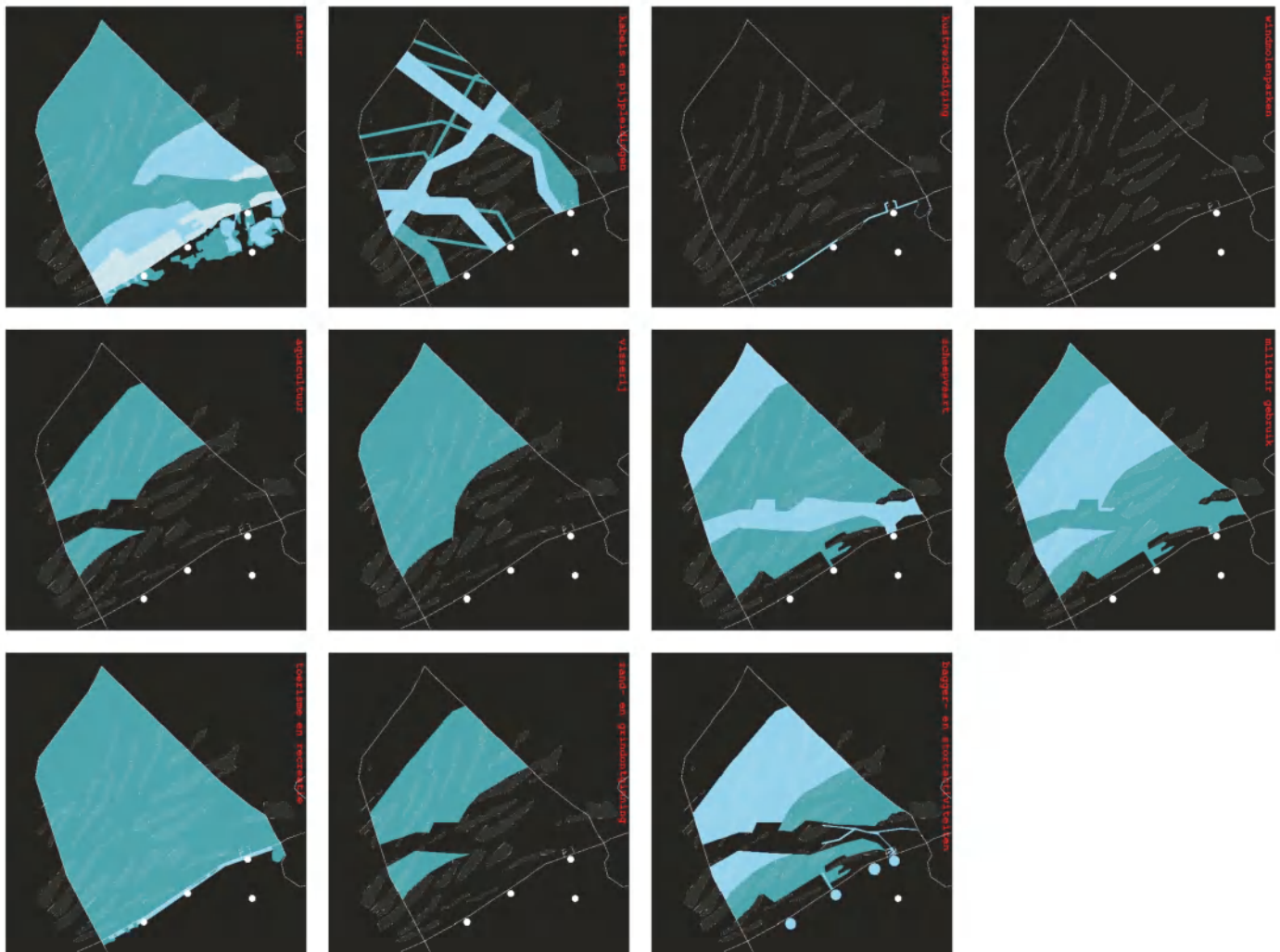


reducing and extensifying activities that cause disturbance to nature
prohibiting activities with an excessive impact on nature

Map III.1.4.2k. Scenario 3: The Natural Sea - spatial concepts
(Structure maps: Maritime Institute - Gent University)



Map III.1.4.2I. Scenario 3: The Natural Sea - spatial structure plan
(Structure map: Maritime Institute - Gent University)



Map III.1.4.2m. Scenario 3: The Natural Sea - significance for the “uses” of the BPNS

left to right:

top row: nature conservation - cables & pipelines - coastal defense - wind parks

second row: aquaculture - fishing - shipping - military use

last row: tourism & recreation - sand & gravel extraction - dredging & dumping of dredgings

(Structure maps: Maritime Institute - Gent University)

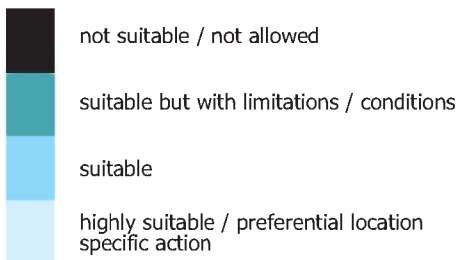




Figure III.1.4.2f. Scenario 3: The Natural Sea - atmospheric image
(Maritime Institute - Gent University)

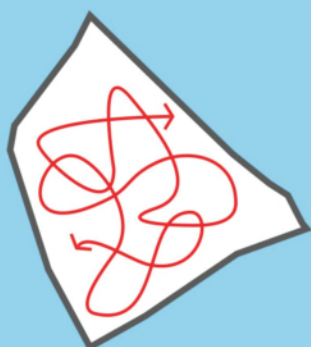


Map III.1.4.2n. Scenario 4: The Mobile Sea - the broader context
(Structure map: Maritime Institute - Gent University)

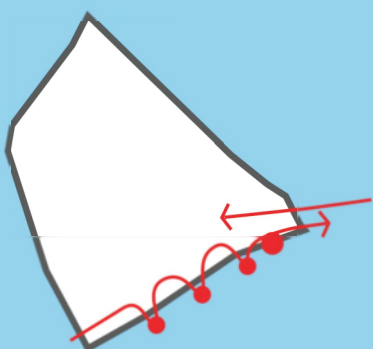
the mobile sea



concentration of
alternating activities on
the sandbanks
(fast regeneration)

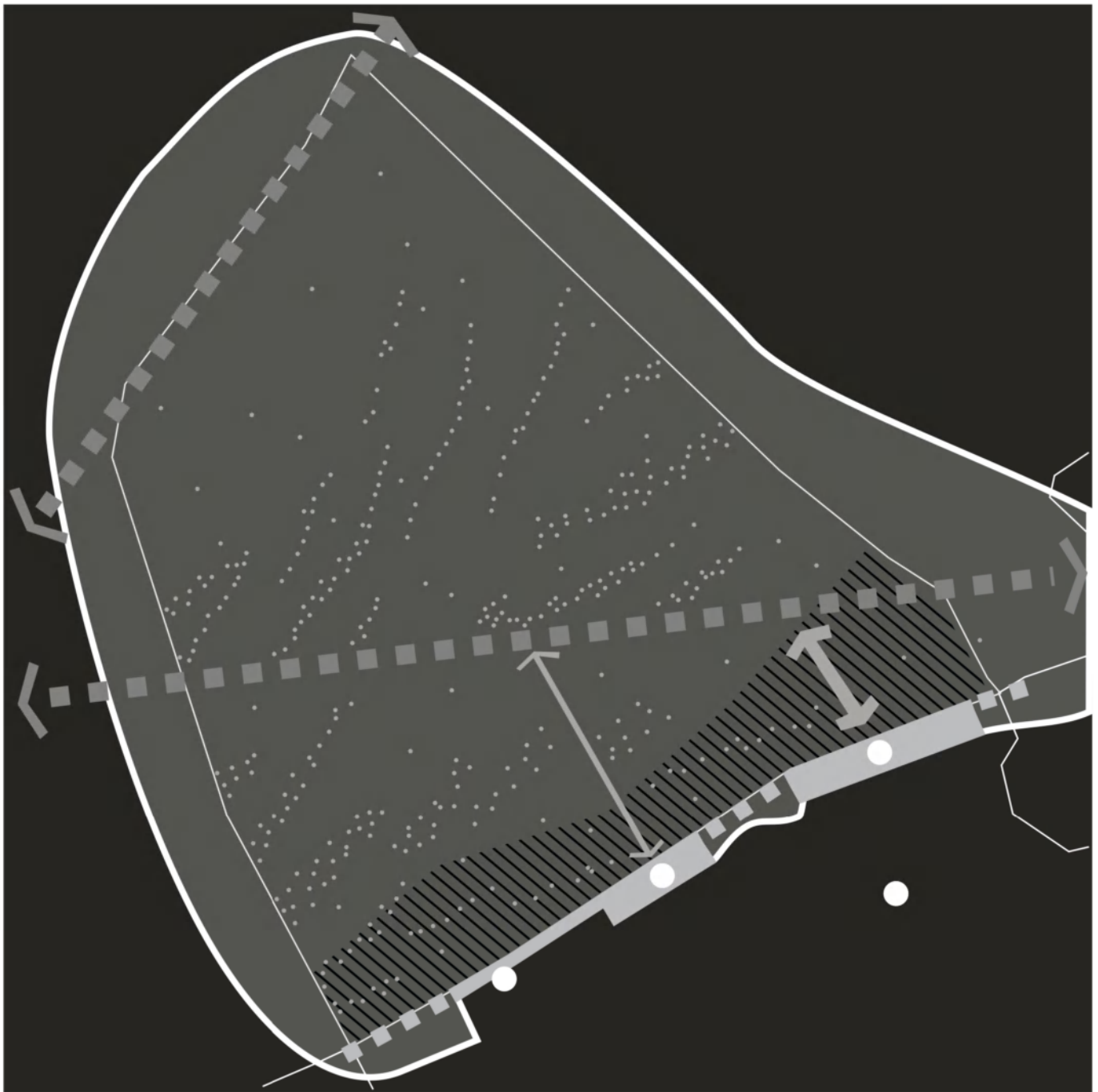


mobile energy platforms

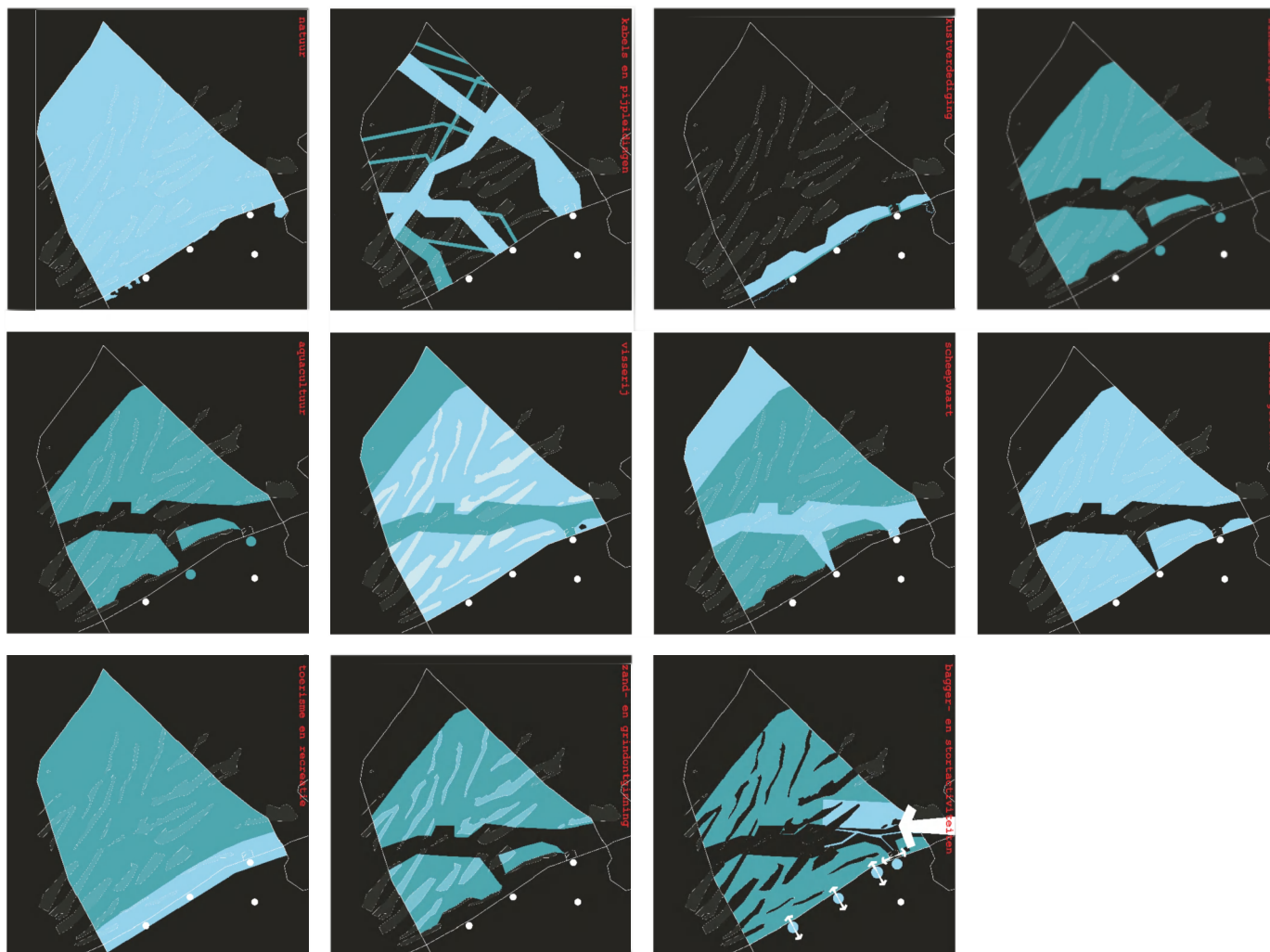


coastal currents yield
natural dredging of ports
and shipping lanes

Map III.1.4.2o. Scenario 4: The Mobile Sea - spatial concepts
(Structure maps: Maritime Institute - Gent University)



Map III.1.4.2p. Scenario 4: The Mobile Sea - spatial structure plan
(Structure map: Maritime Institute - Gent University)



Map III.1.4.2q. Scenario 4: The Mobile Sea - significance for the "uses" of the BPNS

left to right:

top row: nature conservation - cables & pipelines - coastal defense - wind parks

second row: aquaculture - fishing - shipping - military use

last row: tourism & recreation - sand & gravel extraction - dredging & dumping of dredgings

(Structure maps: Maritime Institute - Gent University)

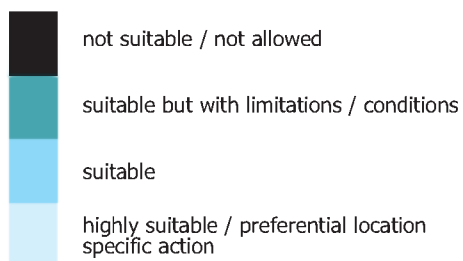
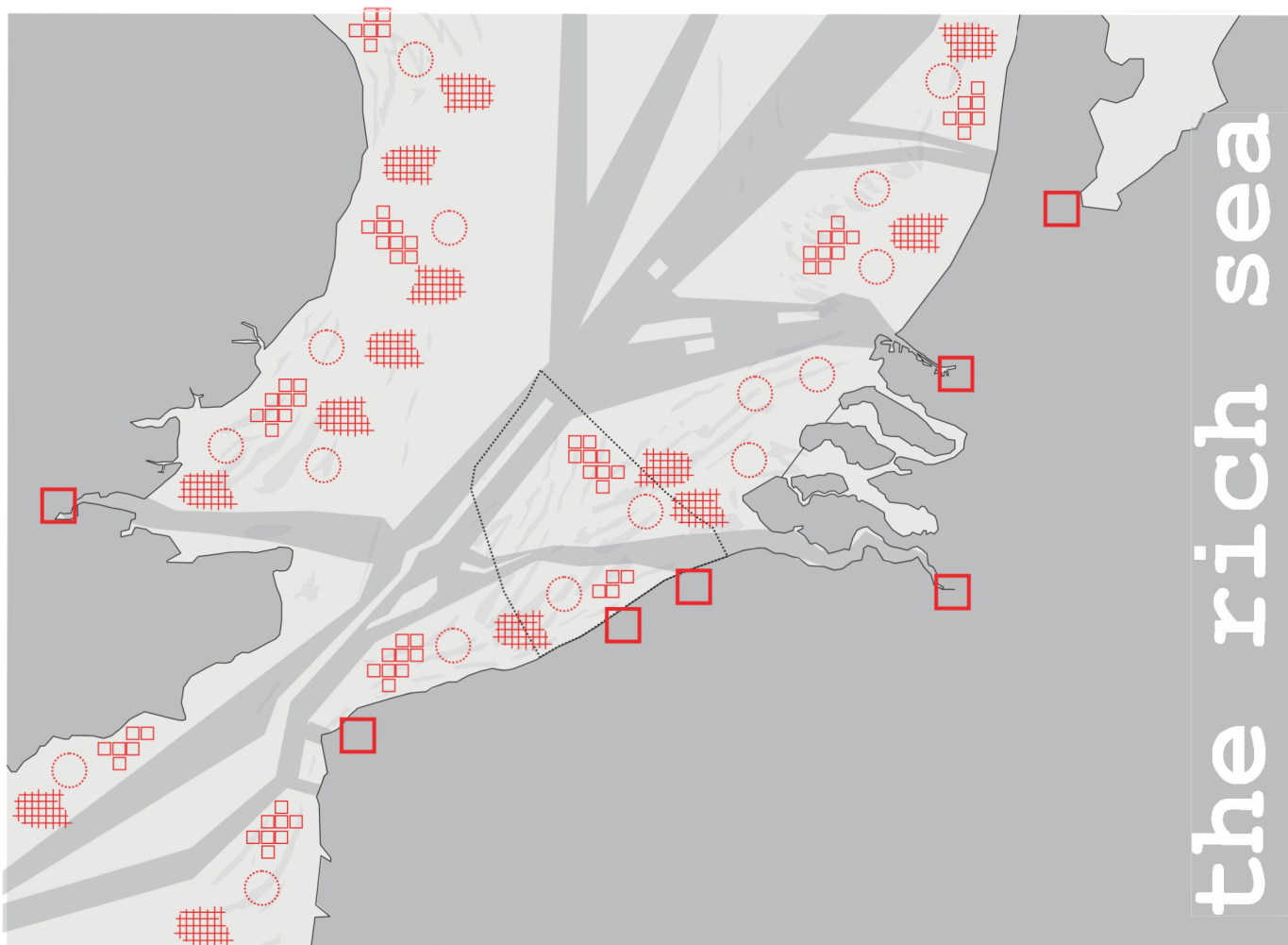


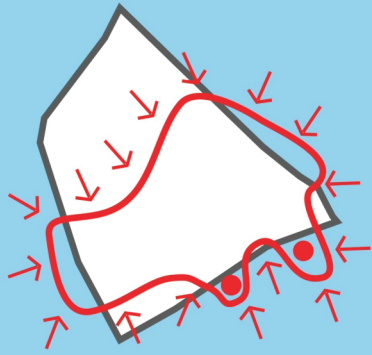


Figure III.1.4.2g. Scenario 4: The Mobile Sea - atmospheric image
(Maritime Institute - Gent University)

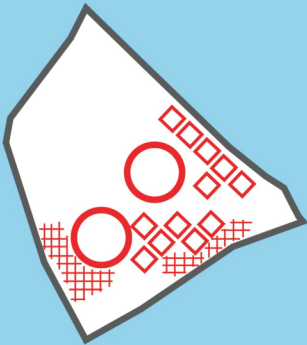


Map III.1.4.2r. Scenario 5: The Rich Sea - the broader context
(Structure map: Maritime Institute - Gent University)

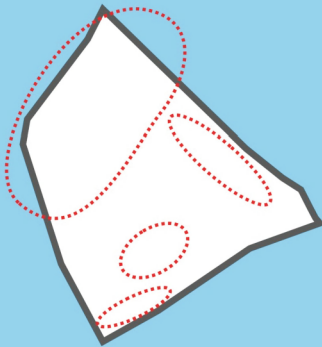
the rich sea



concentration of economic activities in a central area

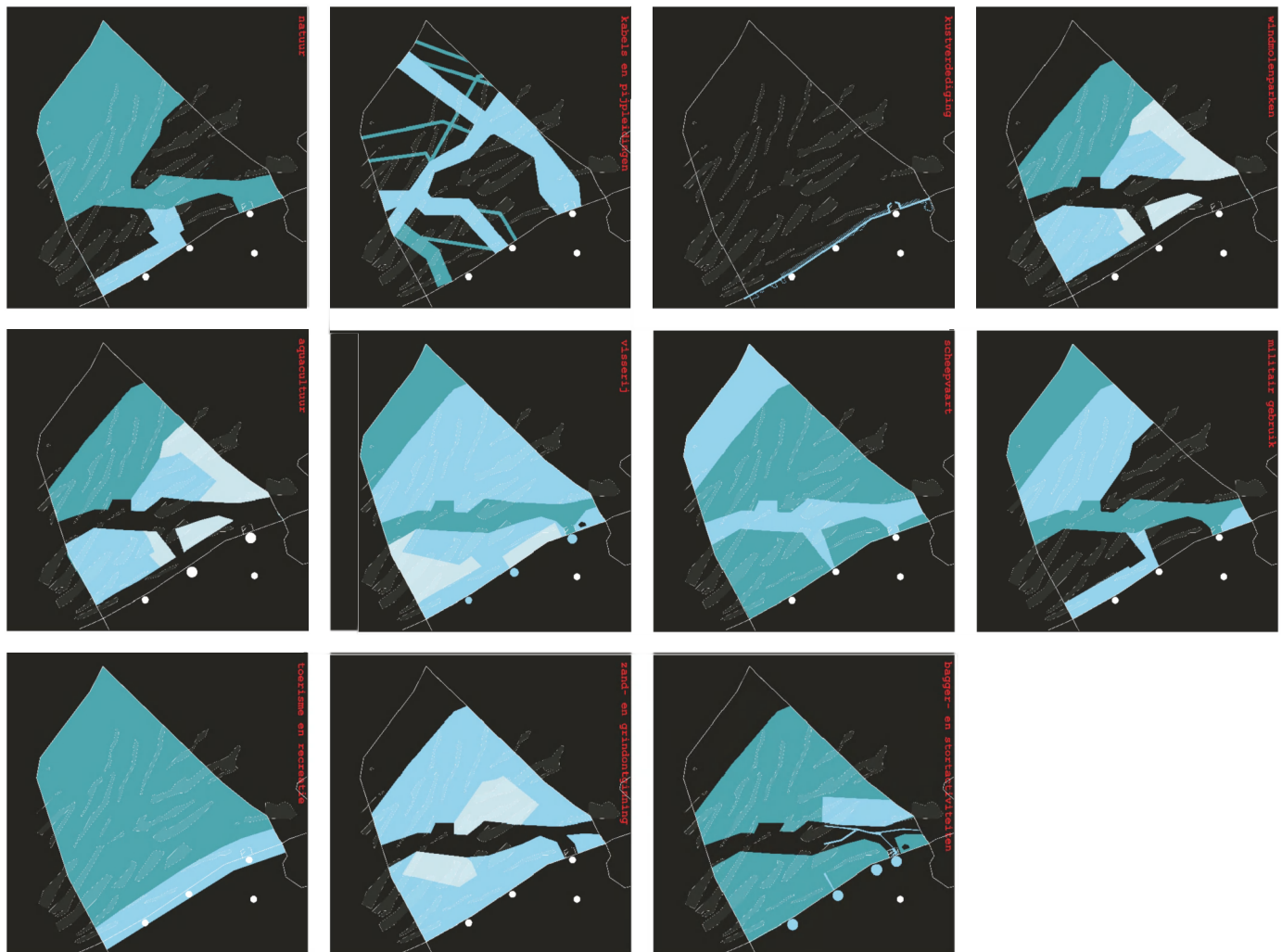


most important economic activities (fishing, sand & gravel extraction, wind parks) are allocated to a specific area (concession zones) based on economic suitability



natural and other 'sheltered' areas (wind parks, deep sea) function as storage rooms (additional possibilities for fishery and aquaculture)

Map III.1.4.2s. Scenario 5: The Rich Sea - spatial concepts
(Structure maps: Maritime Institute - Gent University)



Map III.1.4.2u. Scenario 5: The Rich Sea - significance for the "uses" of the BPNS

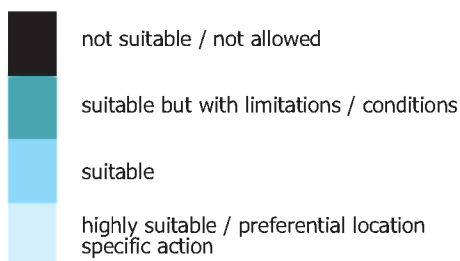
left to right:

top row: nature conservation - cables & pipelines - coastal defense - wind parks

second row: aquaculture - fishing - shipping - military use

last row: tourism & recreation - sand & gravel extraction - dredging & dumping of dredgings

(Structure maps: Maritime Institute - Gent University)



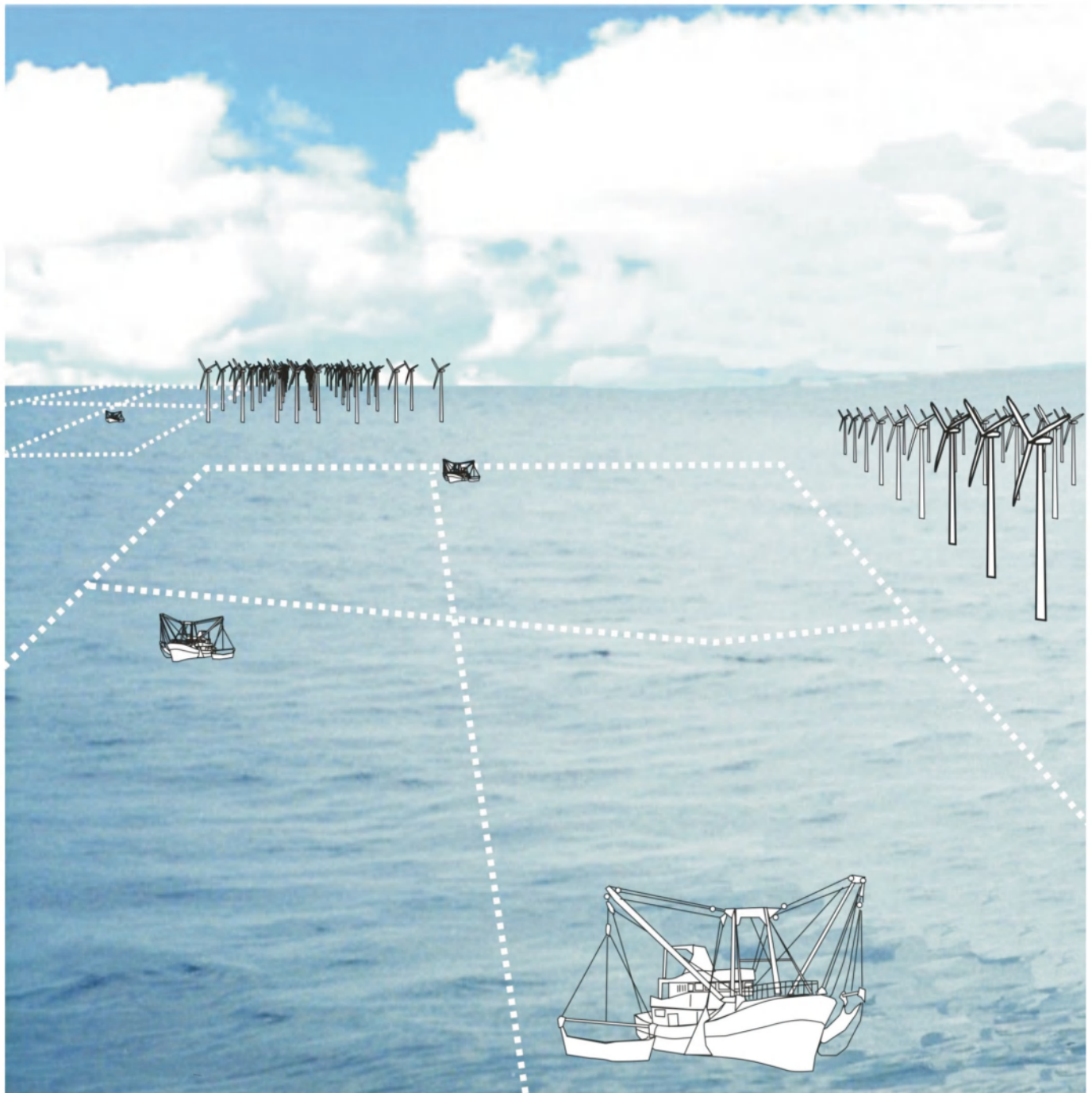
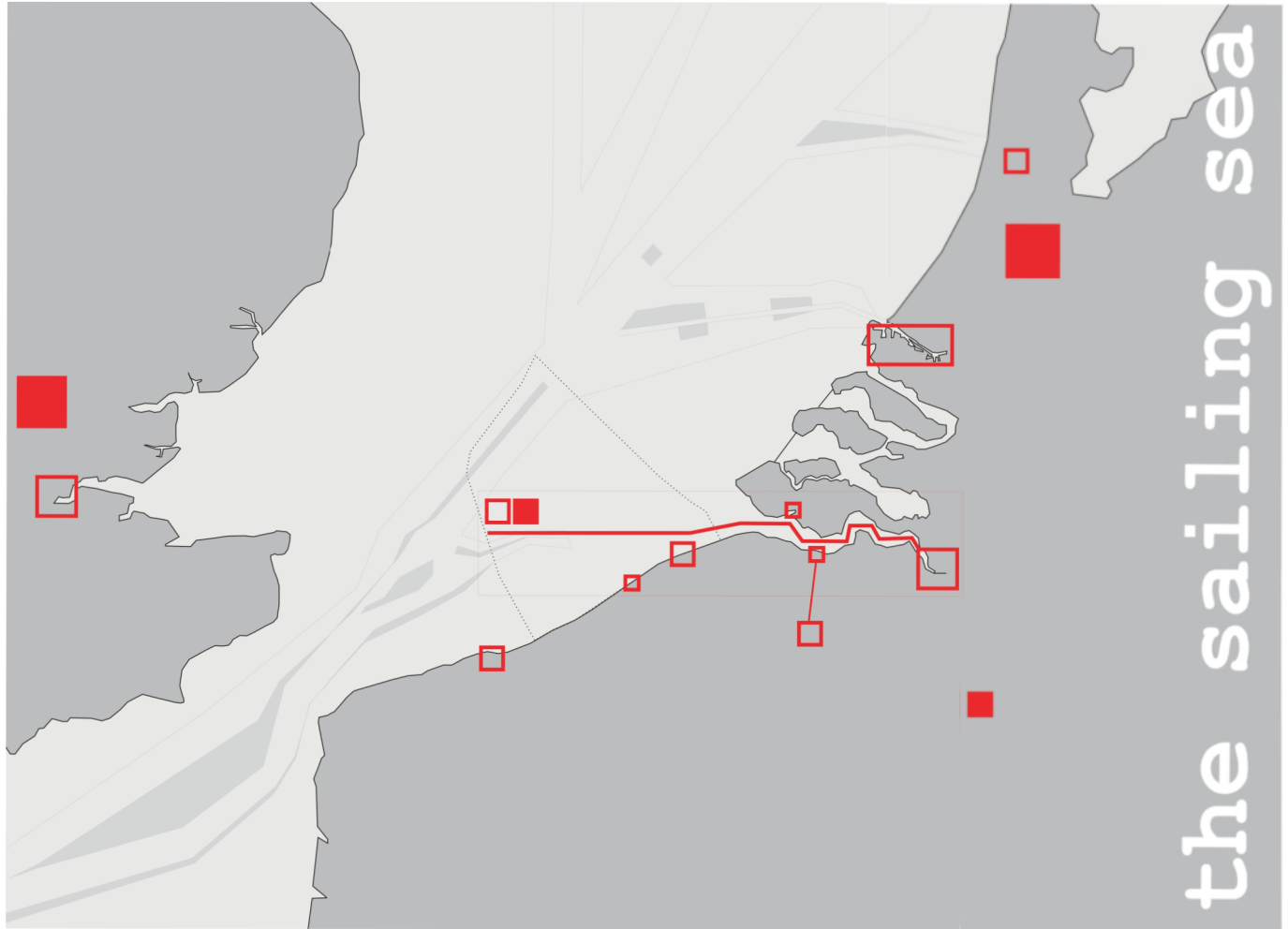
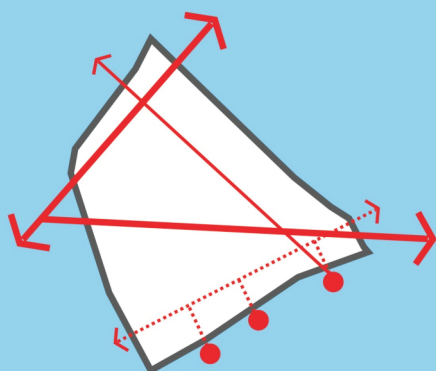


Figure III.1.4.2h. Scenario 5: The Rich Sea - atmospheric image
(Maritime Institute - Gent University)

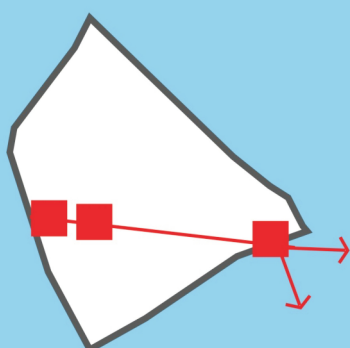


Map III.1.4.2v. Scenario 6: The Sailing Sea - the broader context
(Structure map: Maritime Institute - Gent University)

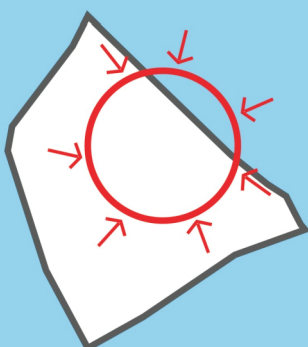
the sailing sea



development of a differentiated mobility network
(short sea shipping - traffic separation for economic shipping - ferry lines)

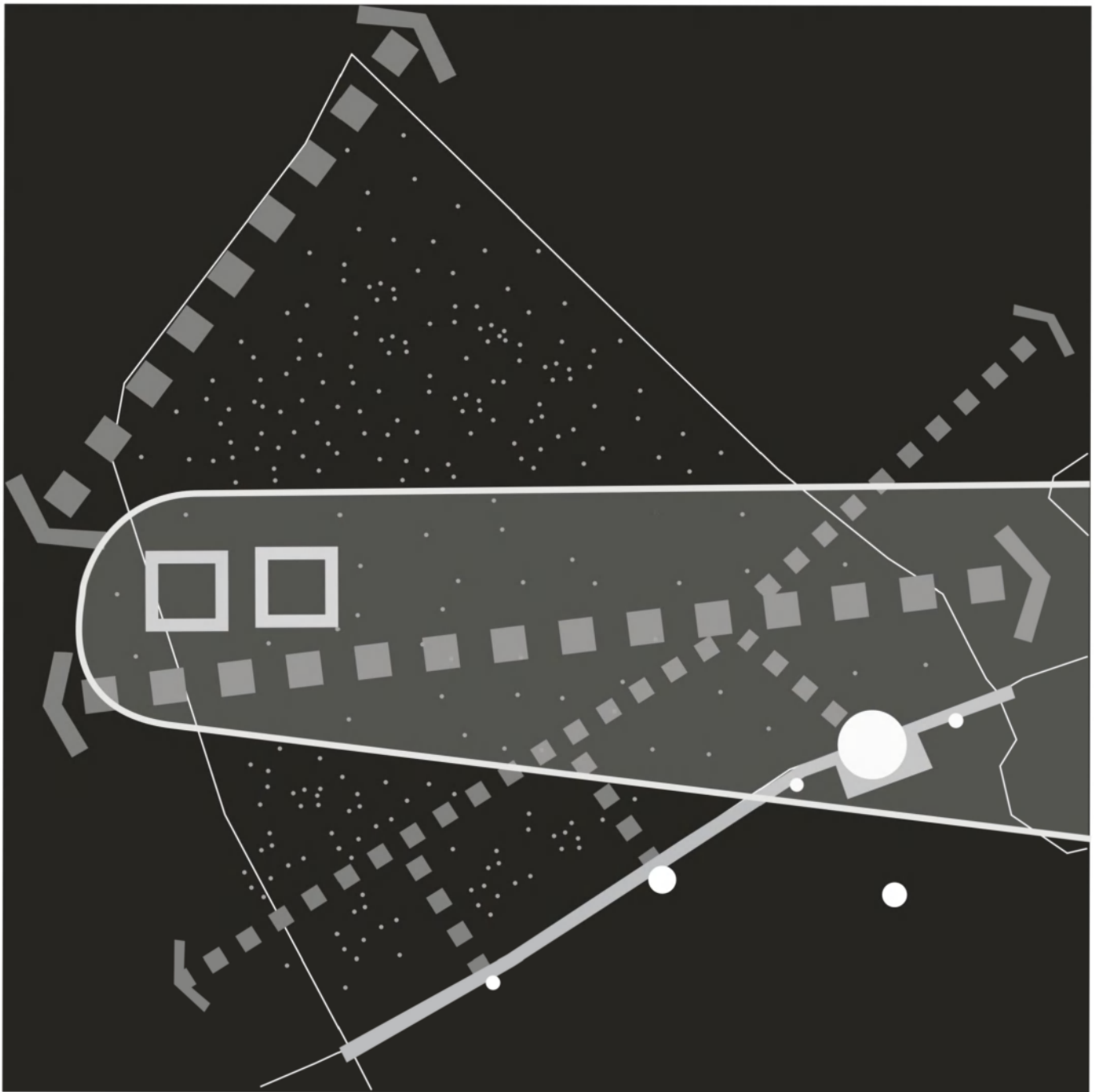


development of a port and airport at sea, connected to the port of Zeebrugge and to relieve Oostende, Zaventem,...

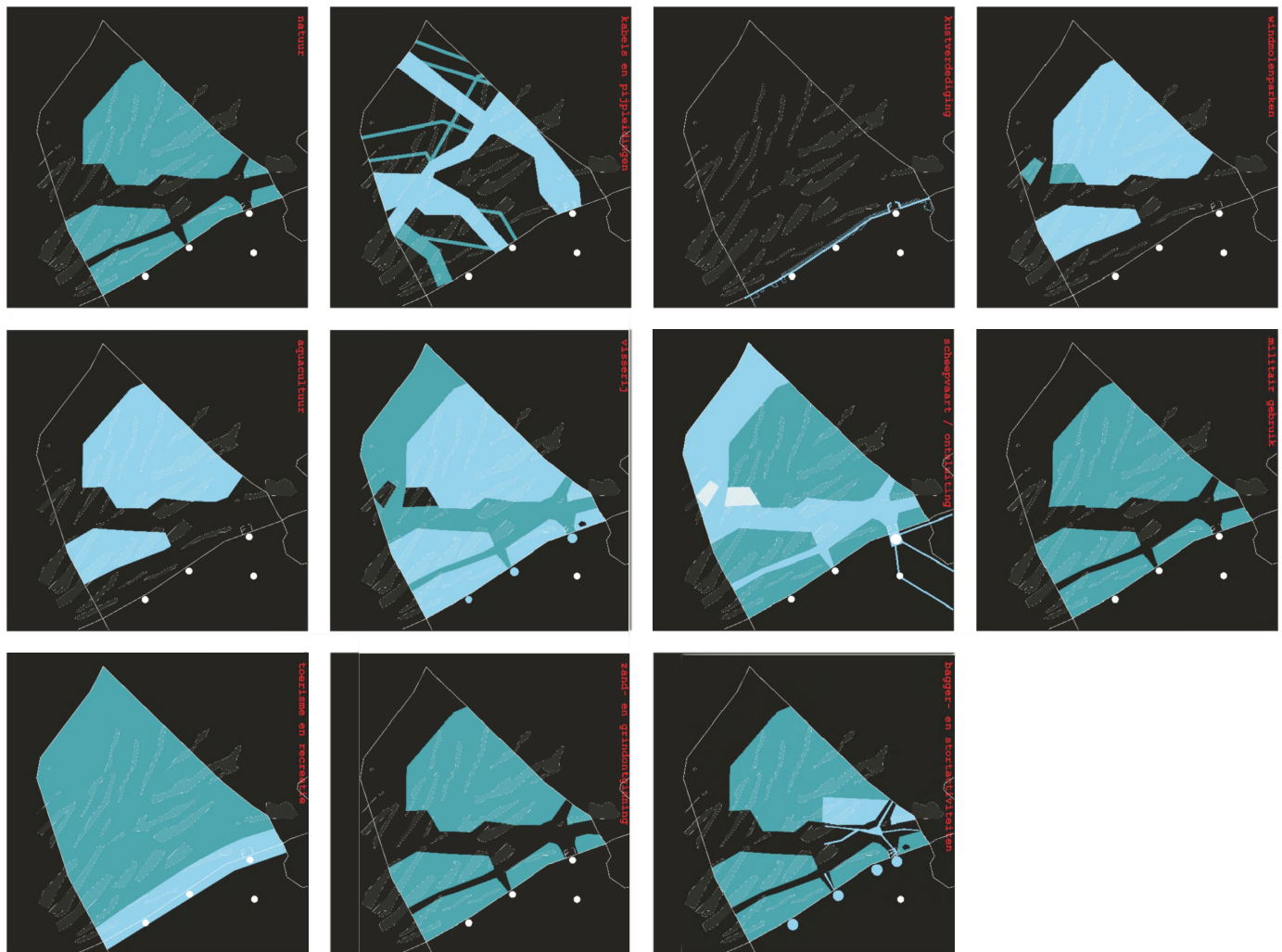


concentration of other economic activities

Map III.1.4.2w. Scenario 6: The Sailing Sea - spatial concepts
(Structure maps: Maritime Institute - Gent University)



Map III.1.4.2x. Scenario 6: The Sailing Sea - spatial structure plan
(Structure map: Maritime Institute - Gent University)



Map III.1.4.2y. Scenario 6: The Sailing Sea - significance for the "uses" of the BPNS

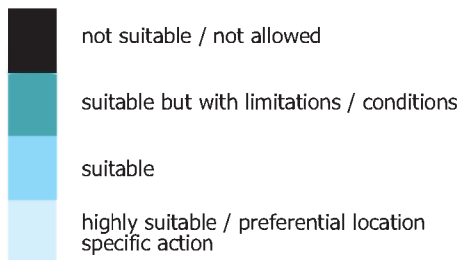
left to right:

top row: nature conservation - cables & pipelines - coastal defense - wind parks

second row: aquaculture - fishing - shipping / transport - military use

last row: tourism & recreation - sand & gravel extraction - dredging & dumping of dredgings

(Structure maps: Maritime Institute - Gent University)



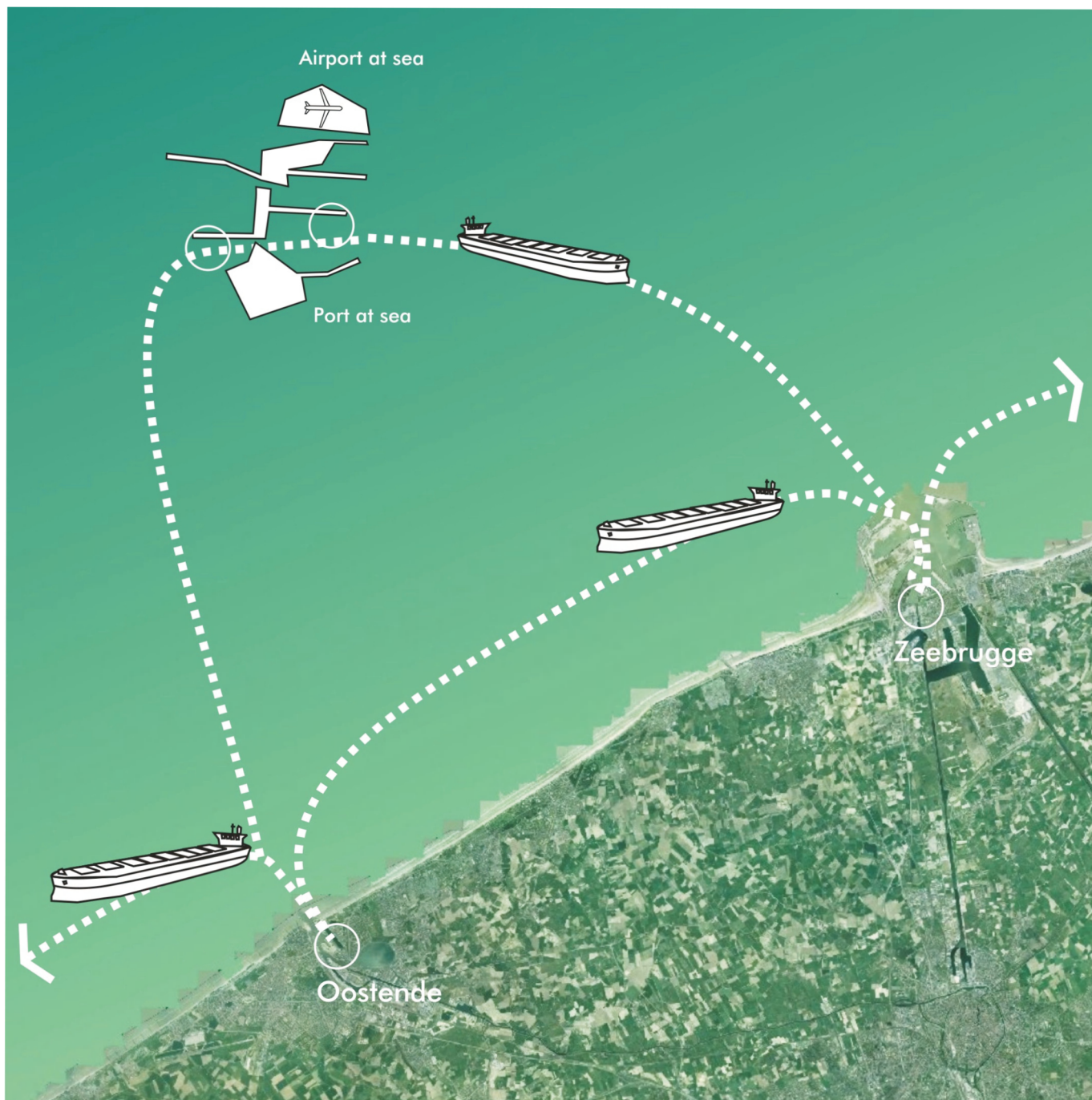
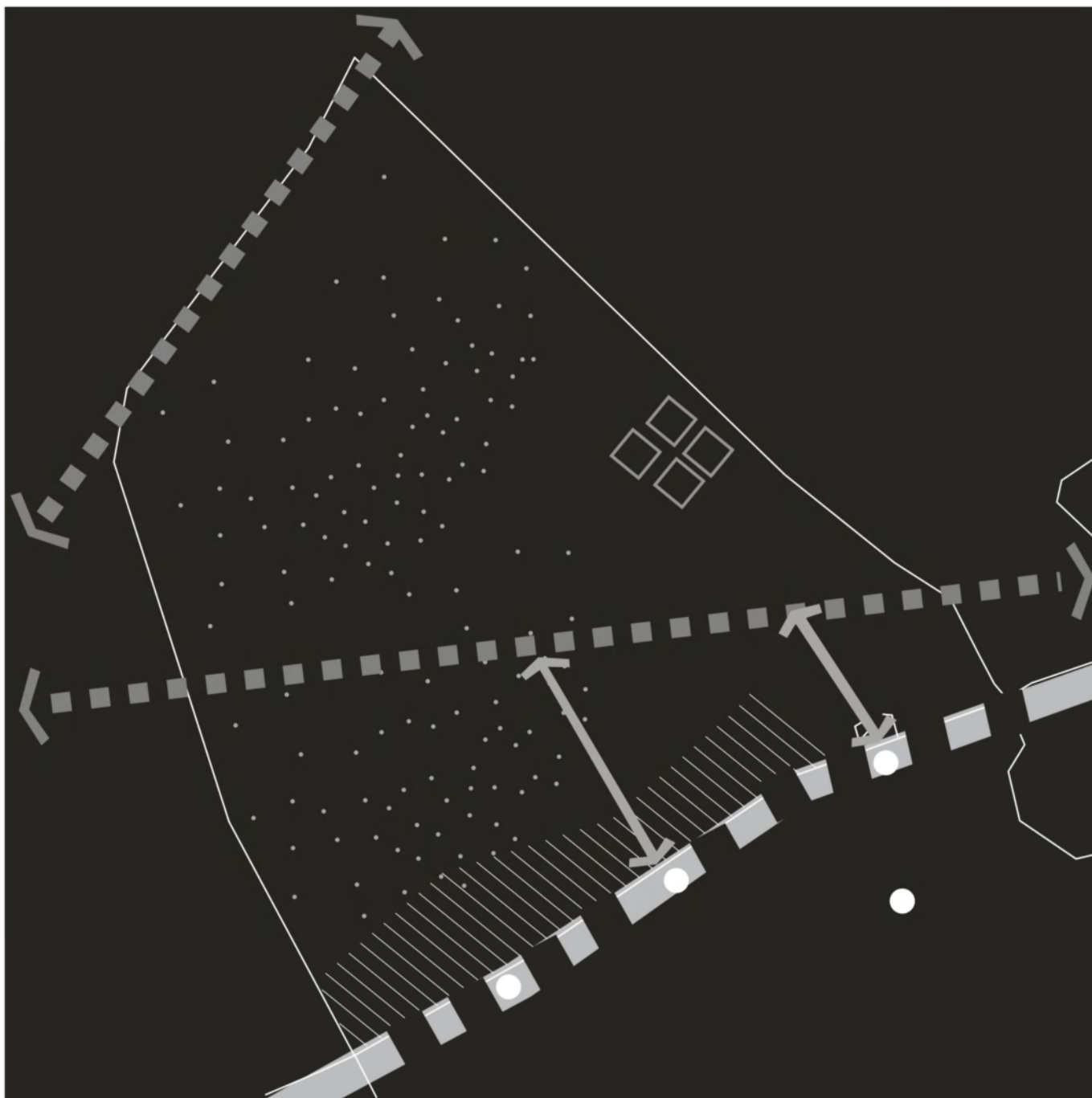











Figure III.1.4.2i. Scenario 6: The Sailing Sea - atmospheric image

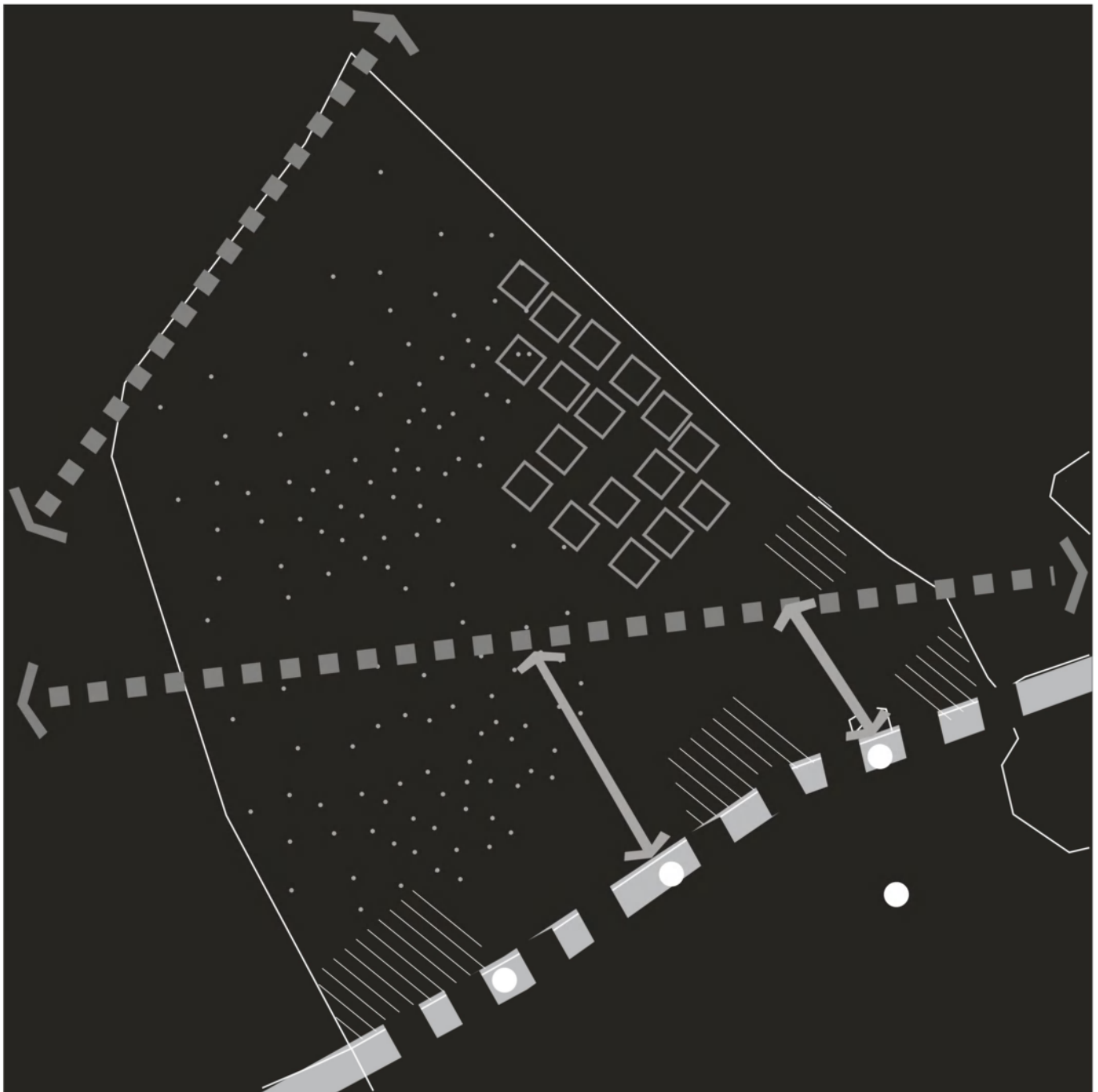
orthophoto: <http://www.giswest.be/website/luchtfotos/viewer.htm>

(Maritime Institute - Gent University)

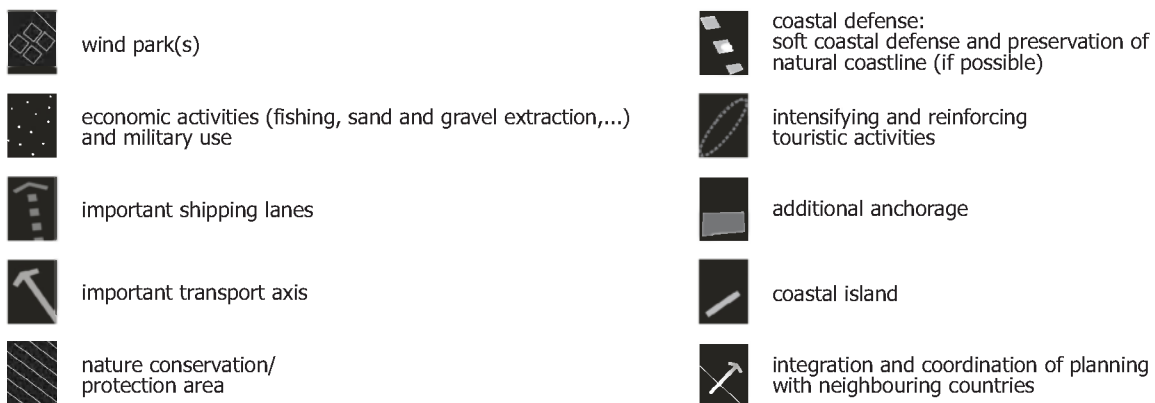


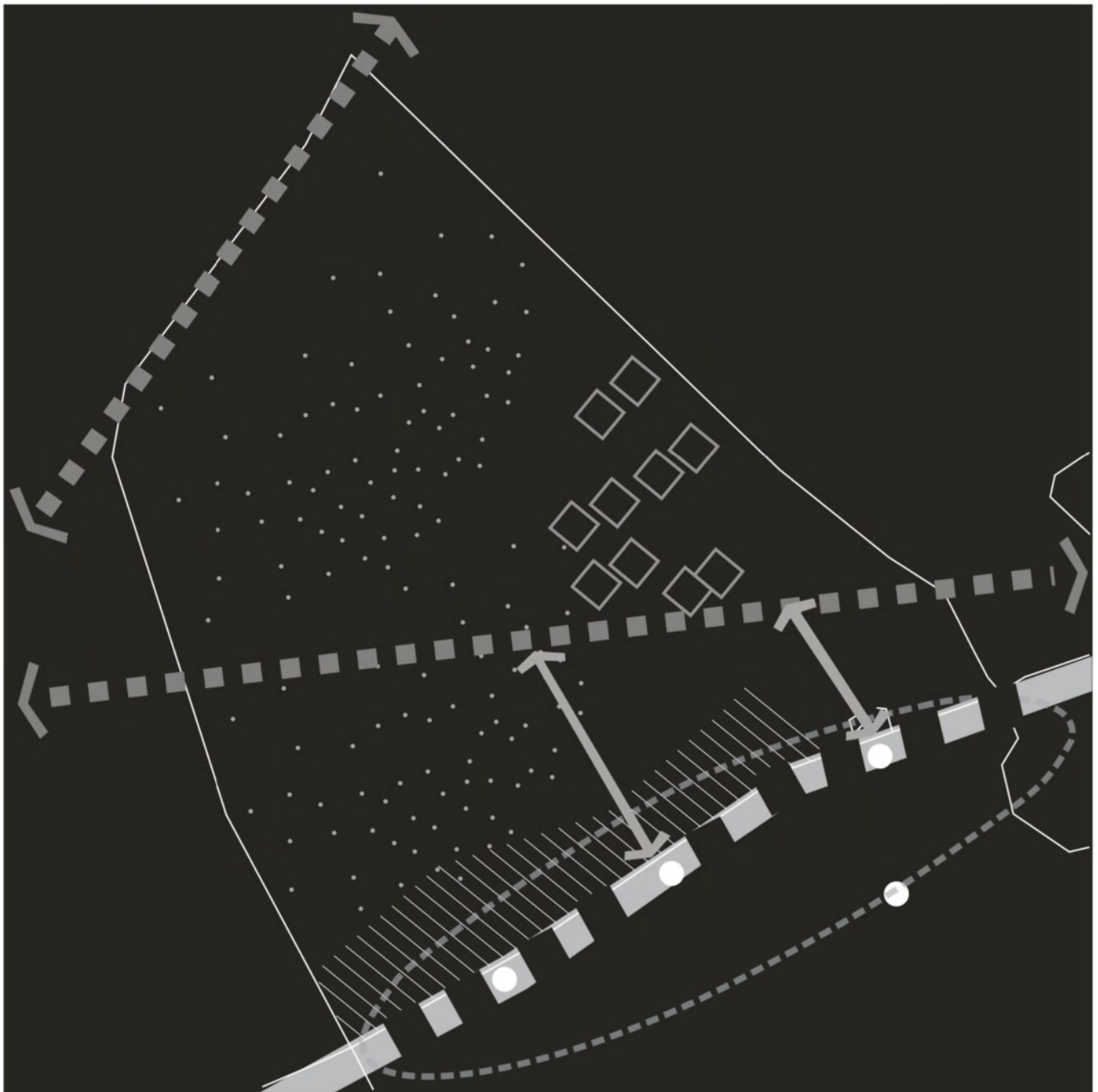
Map III.3a. Workshop results: group 1 - spatial structure plan
(Structure map: Maritime Institute - Gent University)

	wind park(s)		coastal defense: soft coastal defense and preservation of natural coastline (if possible)
	economic activities (fishing, sand and gravel extraction,...) and military use		intensifying and reinforcing touristic activities
	important shipping lanes		additional anchorage
	important transport axis		coastal island
	nature conservation/ protection area		integration and coordination of planning with neighbouring countries













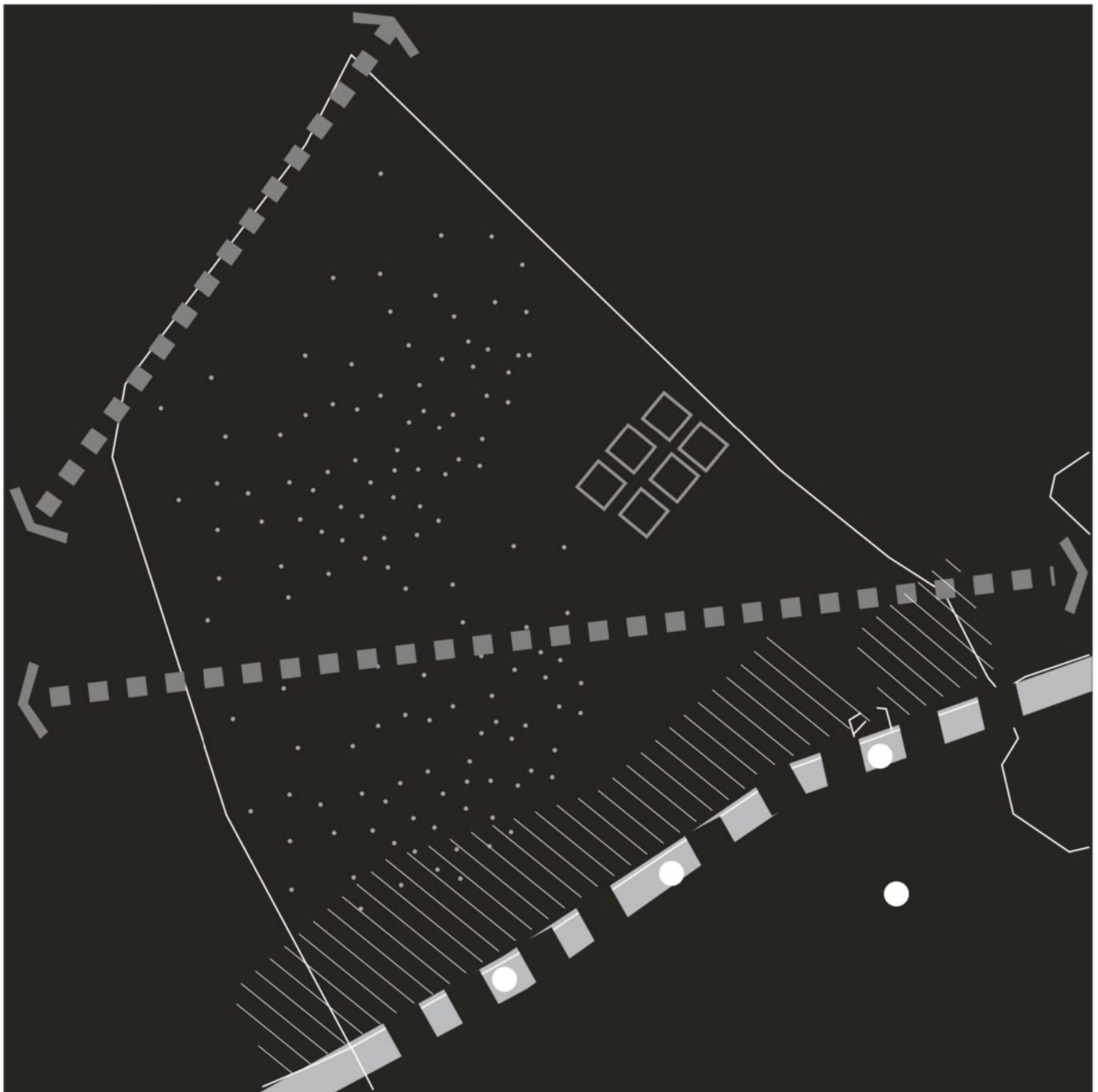
Map III.3b. Workshop results: group 2 - spatial structure plan
(Structure map: Maritime Institute - Gent University)















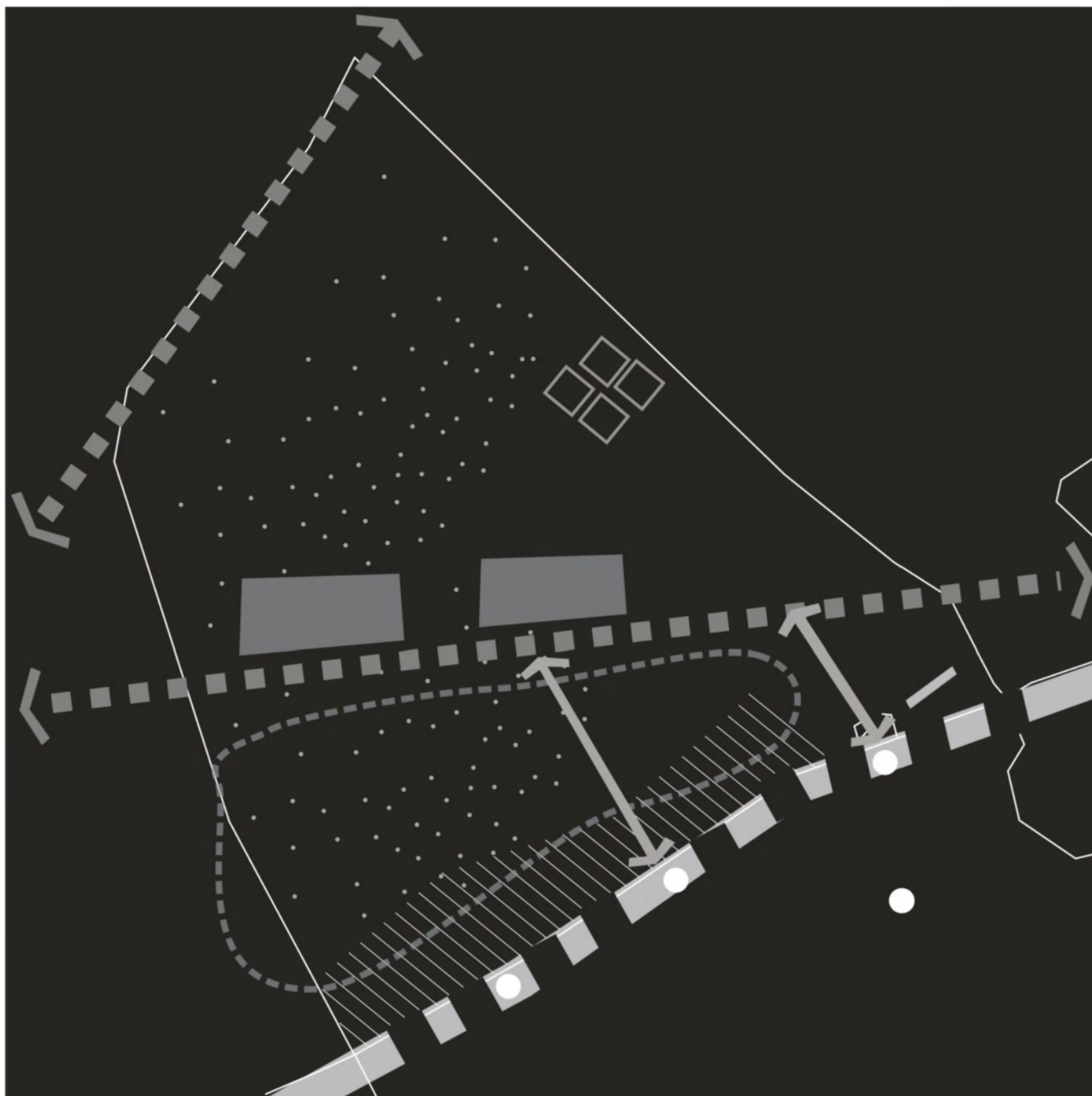
Map III.3c. Workshop results: group 3 - spatial structure plan
(Structure map: Maritime Institute - Gent University)

- | | | | |
|---|---|---|---|
|  | wind park(s) |  | coastal defense:
soft coastal defense and preservation of
natural coastline (if possible) |
|  | economic activities (fishing, sand and gravel extraction,...)
and military use |  | intensifying and reinforcing
touristic activities |
|  | important shipping lanes |  | additional anchorage |
|  | important transport axis |  | coastal island |
|  | nature conservation/
protection area |  | integration and coordination of planning
with neighbouring countries |

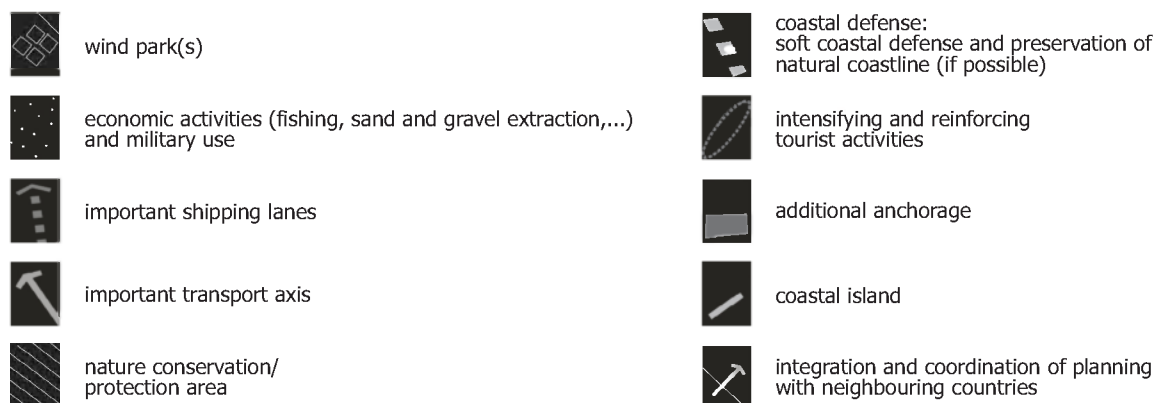


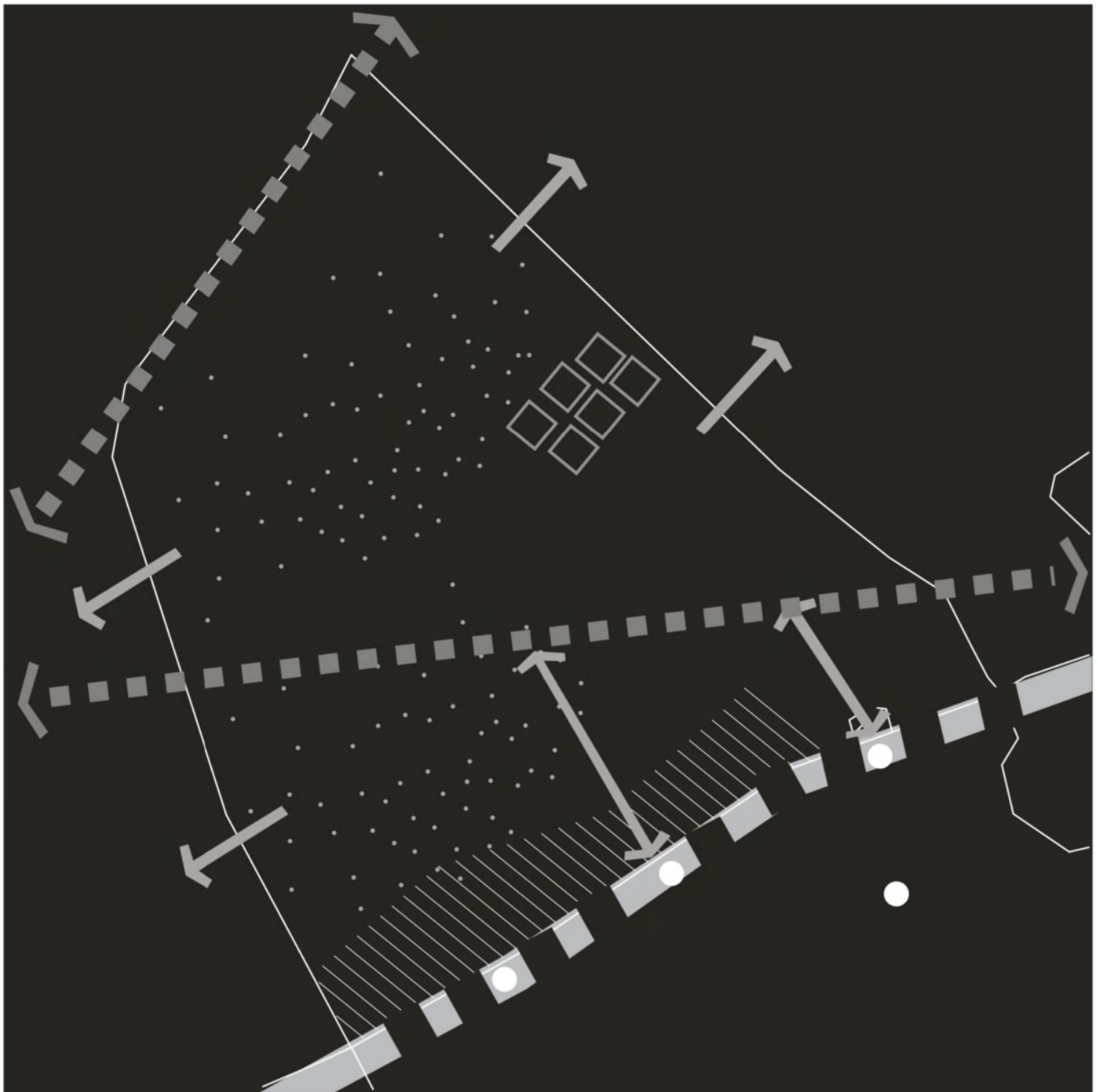
Map III.3d. Workshop results: group 4 - spatial structure plan
 (Structure map: Maritime Institute - Gent University)

- | | | | |
|---|---|---|---|
|  | wind park(s) |  | coastal defense:
soft coastal defense and preservation of
natural coastline (if possible) |
|  | economic activities (fishing, sand and gravel extraction,...)
and military use |  | intensifying and reinforcing
touristic activities |
|  | important shipping lanes |  | additional anchorage |
|  | important transport axis |  | coastal island |
|  | nature conservation/
protection area |  | integration and coordination of planning
with neighbouring countries |













Map III.3e. Workshop results: group 5 - spatial structure plan
 (Structure map: Maritime Institute - Gent University)





Map III.3f. Workshop results: group 6 - spatial structure plan
 (Structure map: Maritime Institute - Gent University)

- | | | | |
|---|---|---|---|
|  | wind park(s) |  | coastal defense:
soft coastal defense and preservation of
natural coastline (if possible) |
|  | economic activities (fishing, sand and gravel extraction,...)
and military use |  | intensifying and reinforcing
touristic activities |
|  | important shipping lanes |  | additional anchorage |
|  | important transport axis |  | coastal island |
|  | nature conservation/
protection area |  | integration and coordination of planning
with neighbouring countries |