COASTAL DYNAMICS: NORTHERN COAST OF ODSHERRED AND SEJERØ BAY

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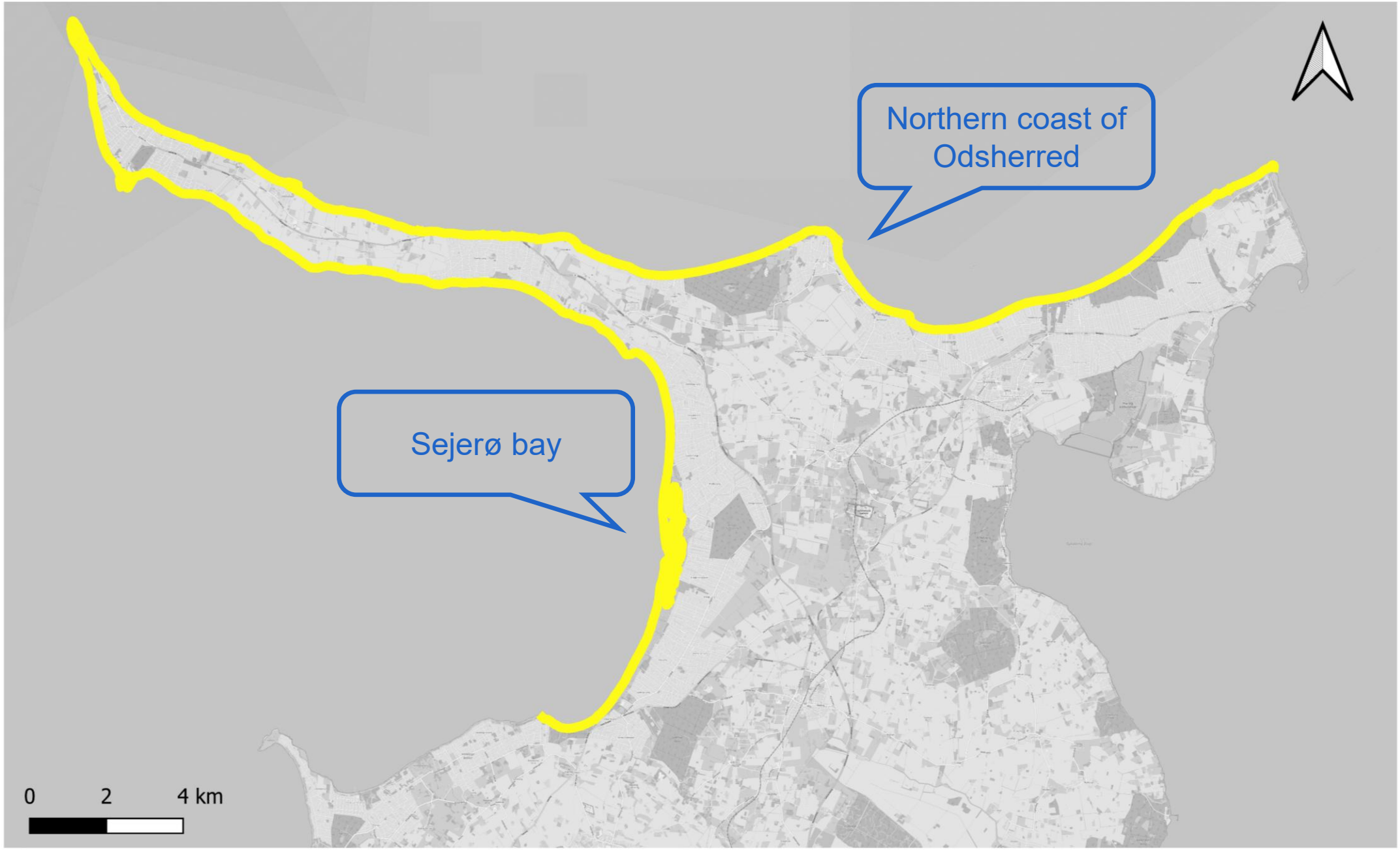
COASTAL ATLAS: COASTAL TYPES

OVERVIEW STUDY AREA



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RESEARCH QUESTION: **HOW DO THE COASTAL DYNAMICS INFLUENCE THE NORTHERN COAST OF ODSHERRED AND SEJERØ BAY?**

What are the main coastal types in the northern part and Sejerø bay area of the Odsherred peninsula?

Which defining and describing attributes contribute to the coastal types?

What are the dynamic processes leading to this classification?

How do the identified coastal types compare to the coastal types defined by the Kystatlas?

What and where are the zones at risk for erosion?

What are the current protective measures that have been taken?

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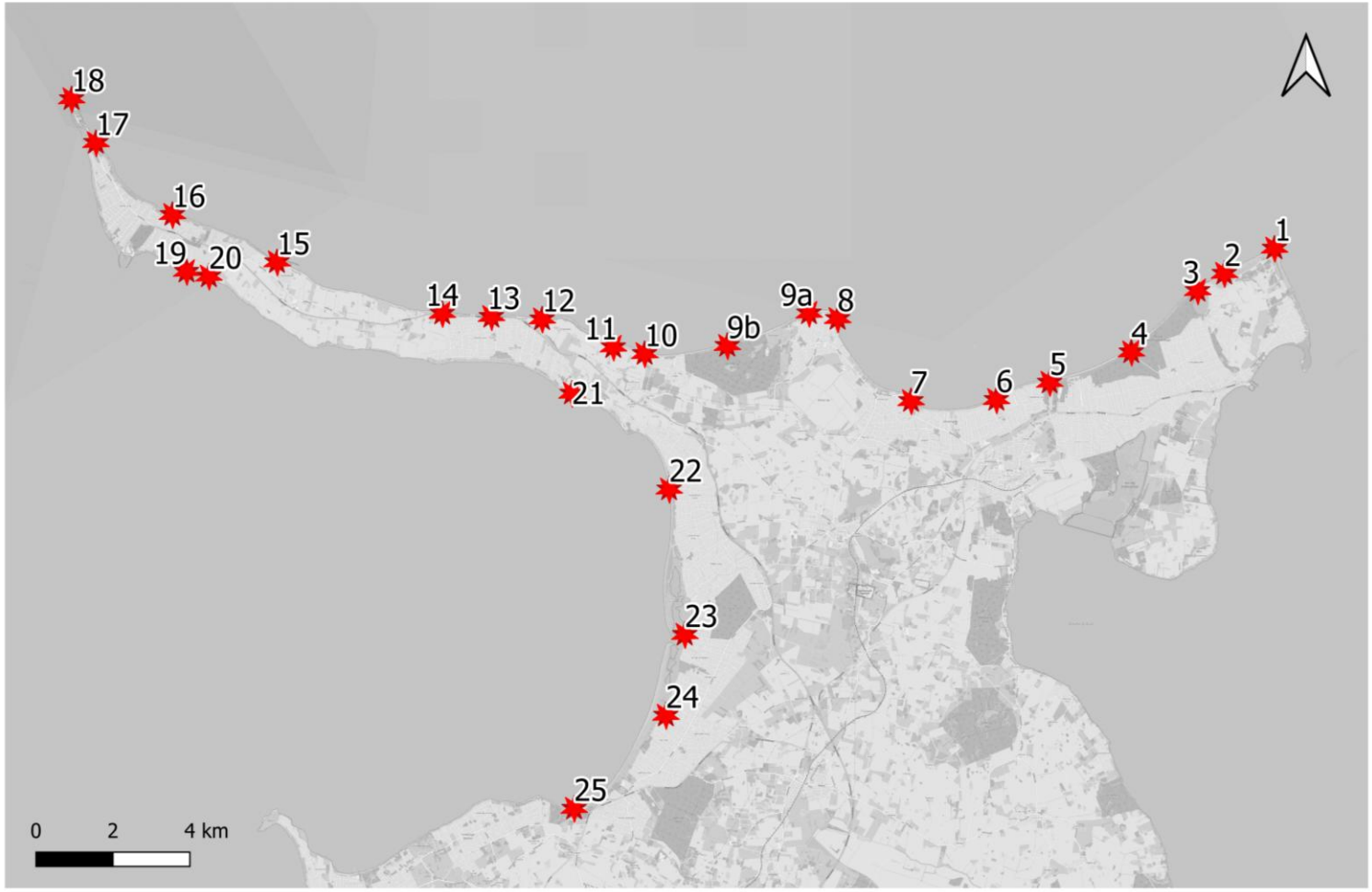
METHODOLOGY

- Literature study
- GIS analysis
- Fieldwork
  - 26 sample points



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3 GOALS

1. Typology
   - Field attributes table
   - Location sample map
   - Coastal type map
   - Cross shore dynamics map
   - Shore dynamics transects

2. Assessment
   - Mapping chronic and acute erosion

3. Supplementary to “Kystatlas”

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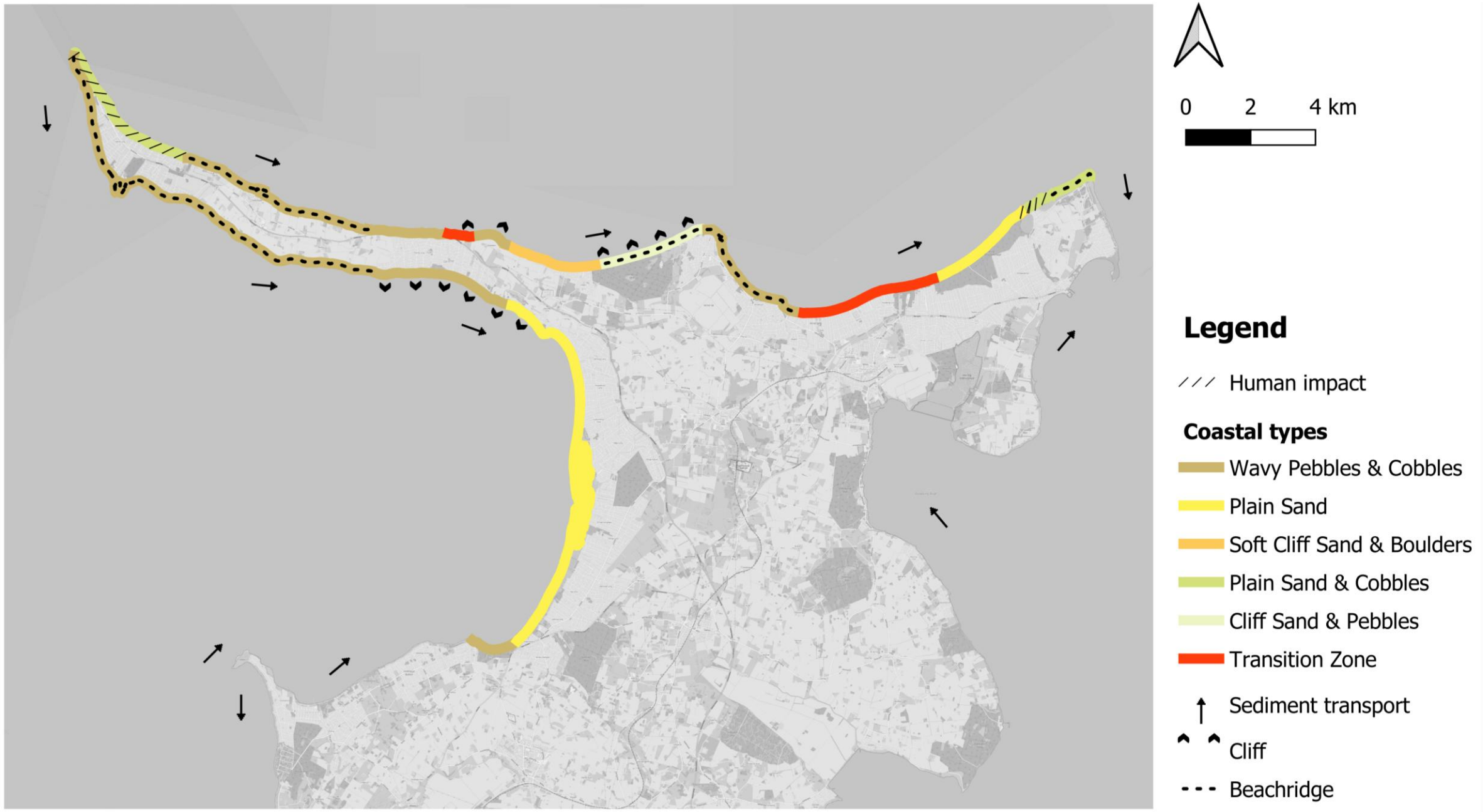
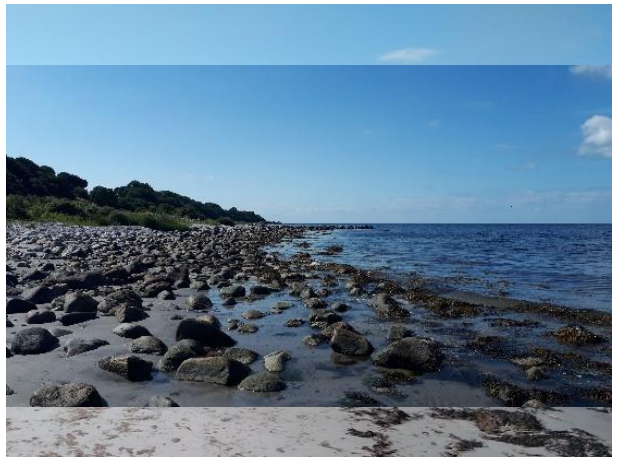
FIELD ATTRIBUTES TABLE

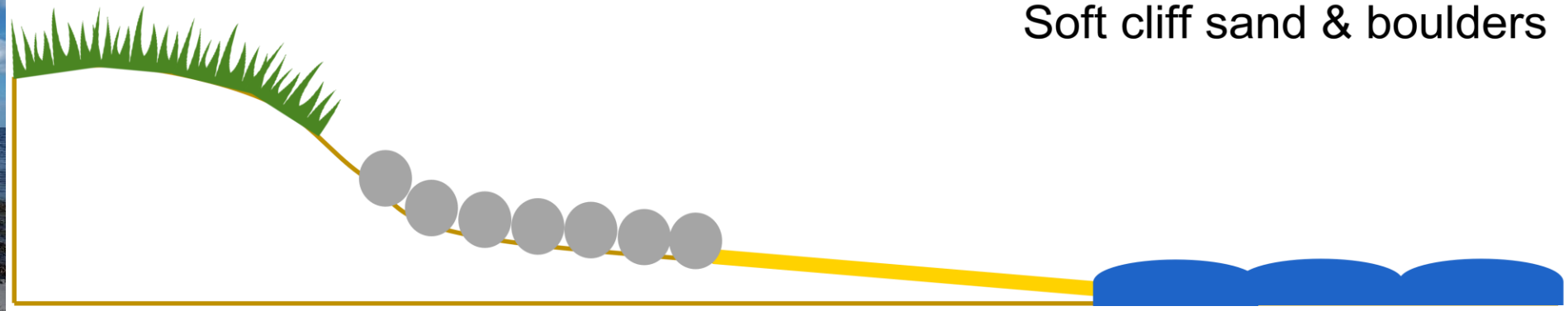
Sample point	Erosion or sedimentation	Texture of beach	Zonation particle sizes (sea to land)	Landuse (first 100 m)	Human influence	Slope	Visibility land to sea	Visibility sea to land	Soil	Bathymetry	Coastal type
1	Erosion	Little sand, pebble, cobble	Big to small	Dunes, heather	None	Storm ridges	High	Medium low	Marine plane, beach ridge	Very gradual	Plain sand and cobbles
2	Erosion	Sand, cobble, little boulder	Big to small	Wetlands	Couple of summerhouses	Slight slope	Average	High	Marine plane	Very gradual	Plain sand and cobbles
3	Erosion	Sand, gravel, boulder, rock (by man)	Big to small	Multiple summerhouses, nature park	Multiple summerhouses wth coastal defence	Small cliff	Average	High	Beach ridge, aeolian plain	Very gradual	Soft cliff sand and boulders
4	Sedimentation	Sand	None	Dunes, beach	Coastal defence (Sand drift plantation)	Slight slope	Average	High	Aeolian plain, dune	Very gradual	Plain Sand
5	Sedimentation	Sand, gravel	Alternation between sand and gravel	Dune, camping	Camping	Slight slope	Average	High	Dune	Very gradual	Transition zone
6	Sedimentation	Sand, gravel, boulder, rock	Rock, boulder, gravel, sand, alternation sand and boulder	Dune, beach, summerhouses	Summerhouses	Slight slope	Average	High	Marine plan, beach ridge	Very gradual	Transition zone
7	Erosion	Sand, gravel, cobble	Alternation between gravel and cobble	Dunes, summerhouses	Summerhouses	Storm ridges	Average	High	Beach ridge	Very gradual	Wavy Pebbles and cobbles
8	Erosion	Sand, gravel, cobble, boulder	Mixed due to excavations	Harbor, town	Harbor, town	Cliffs	Average	Average	Beach ridge	Gradual	Wavy Pebbles and cobbles
...											
20	Erosion	Sand, pebble, cobble, boulder	Sand to mixed	Summerhouses	Pipe, ponton	Steep	high	Average	Beach ridge	Gradual	Wavy Pebbles and cobbles
21	Erosion	Gravel, pebble, cobble	Cobble, gravel, mixed	Agriculture	None	Steady	Low	High	Till plain	Very gradual	Wavy Pebbles and cobbles
22	Sedimentation	Sand	None	Summerhouses	Summerhouses	Flat	Low	High	Dune	Very gradual	Plain Sand
23	Sedimentation	Sand	None	Nature reserve	None	Flat	Low	High	Dune	Very gradual	Plain Sand
24	Sedimentation	Sand	None	Nature reserve	None	Flat	Low	High	Dune	Very gradual	Plain Sand
25	Sedimentation	Sand	None	Nature park	Nature park	Flat	Low	High	Marine plain	Very gradual	Wavy Pebbles and cobbles

MAP OF COASTAL TYPES

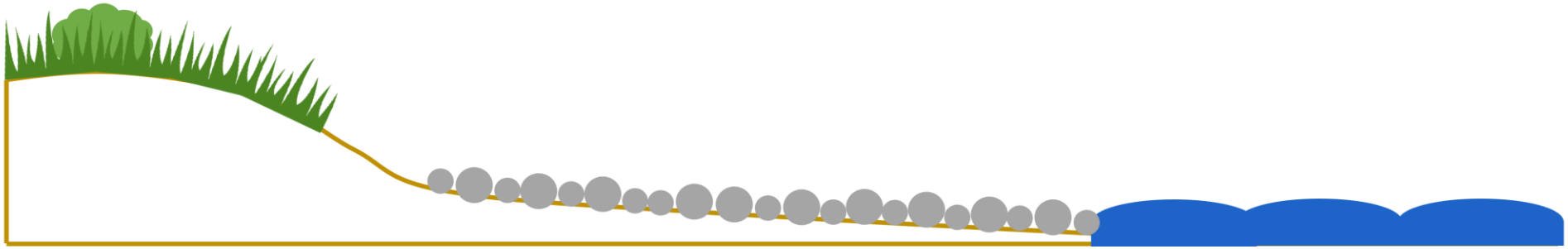


SHORE DYNAMICS: TRANSECTS





Soft cliff sand & boulders



Wavy pebbles & cobbles

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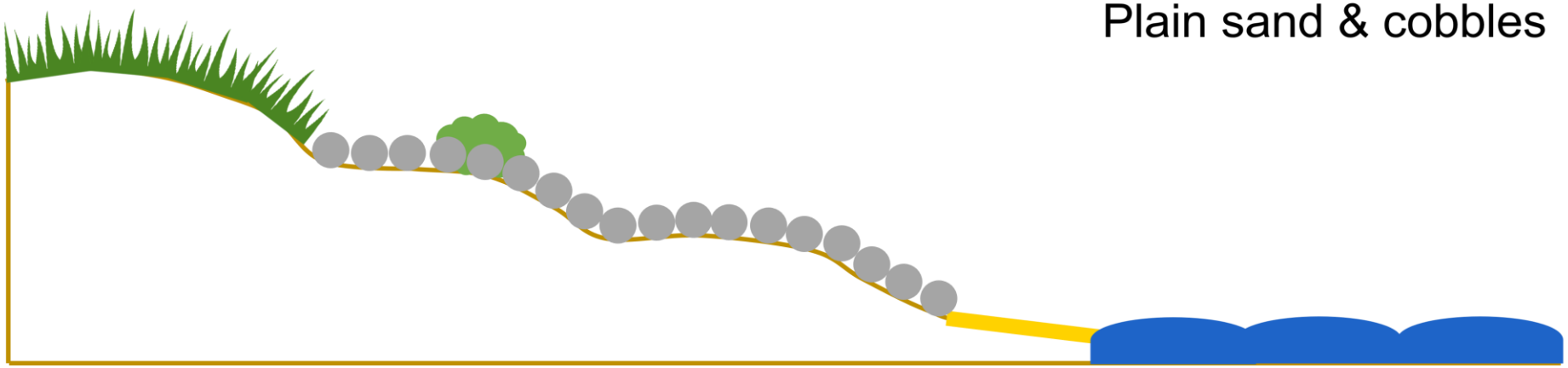
SHORE DYNAMICS: TRANSECTS

Plain sand with human impact

Plain sand & cobbles



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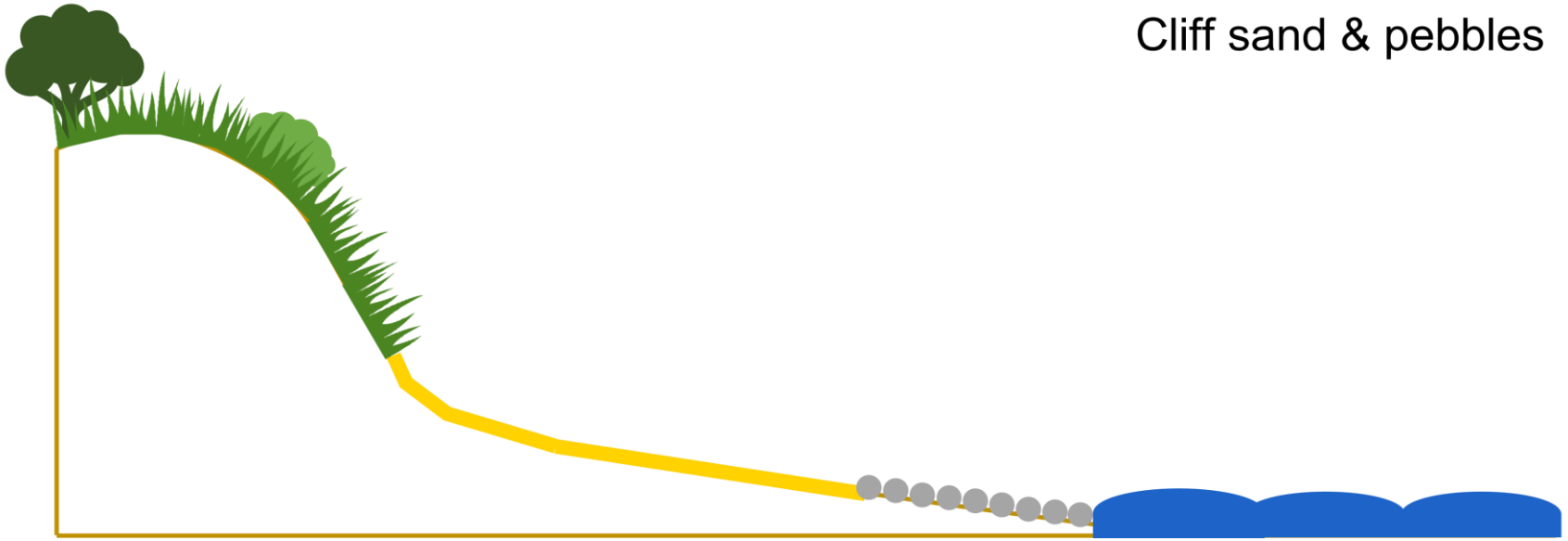

Cliff sand & pebbles

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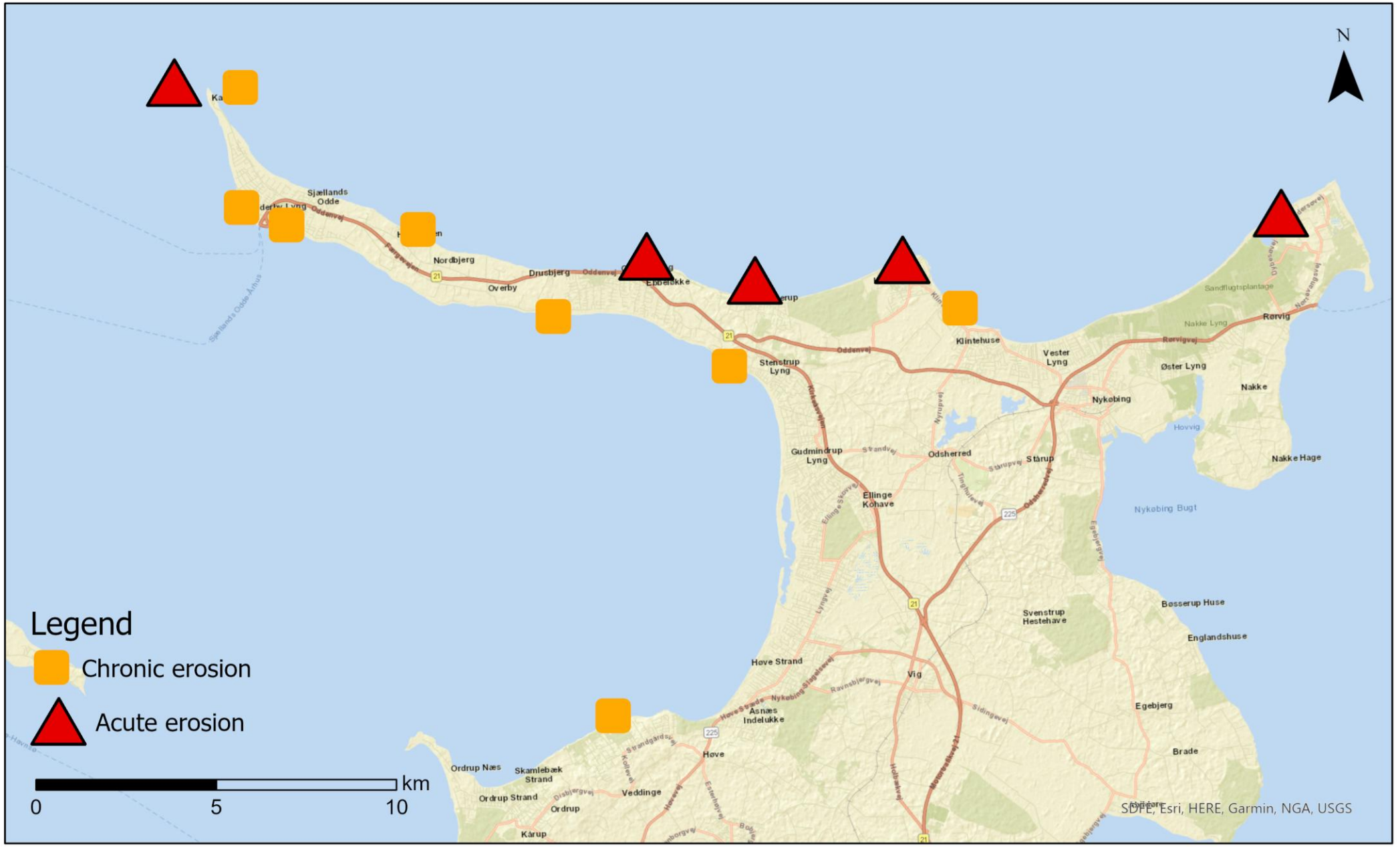
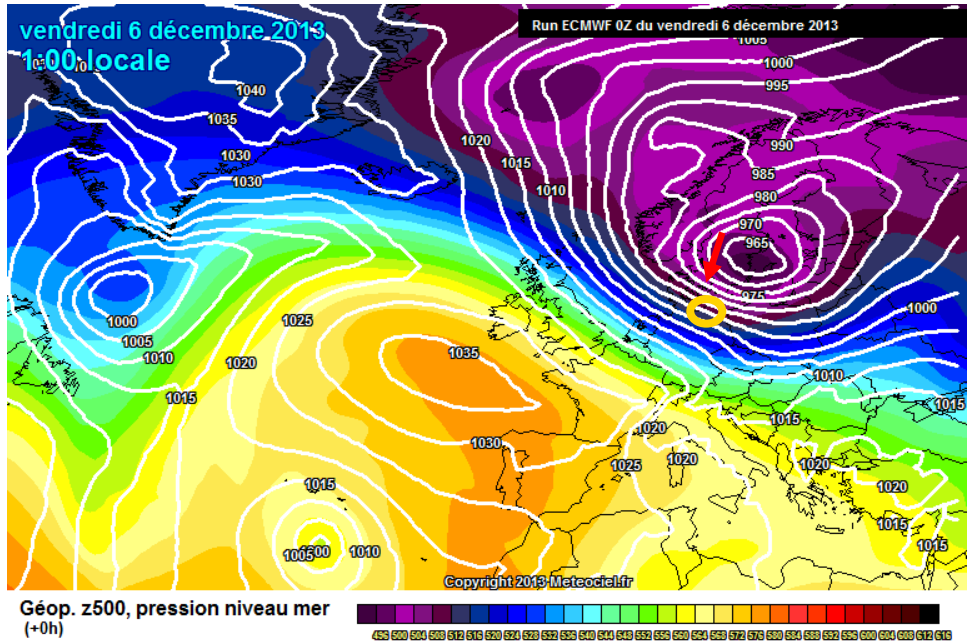
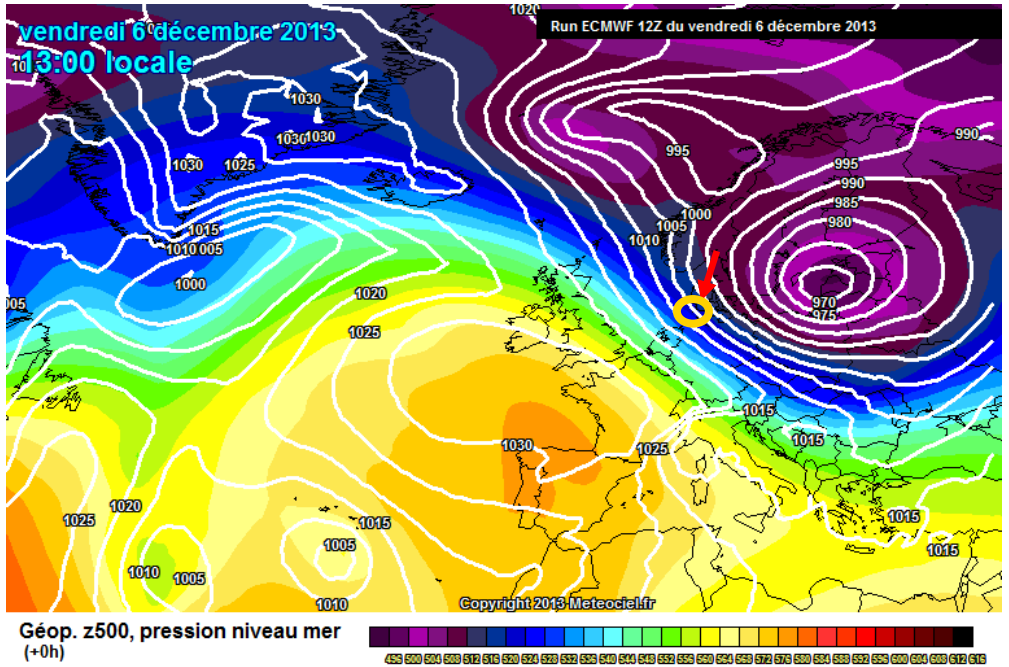
LOCATIONS WITH HIGH EROSION VULNERABILITY



STORM 2013

- For several days strong gusts (up to 150 km/h)
- High storm surge ➔ a lot of erosion





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SOME EXAMPLES

- Damage to houses and structures
- Stones are displaced, but kept the spot from flooding
- Formation of new (small) cliffs

Spring 2013

Spring 2014

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TACKLING EROSION

- Existing measures

(Kystdirektoratet, 2020)

- Room for improvement but trade-off: acute vs. chronic erosion

- Feasibility?

(Maps, 2021)

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REFLECTION ON RESEARCH QUESTIONS

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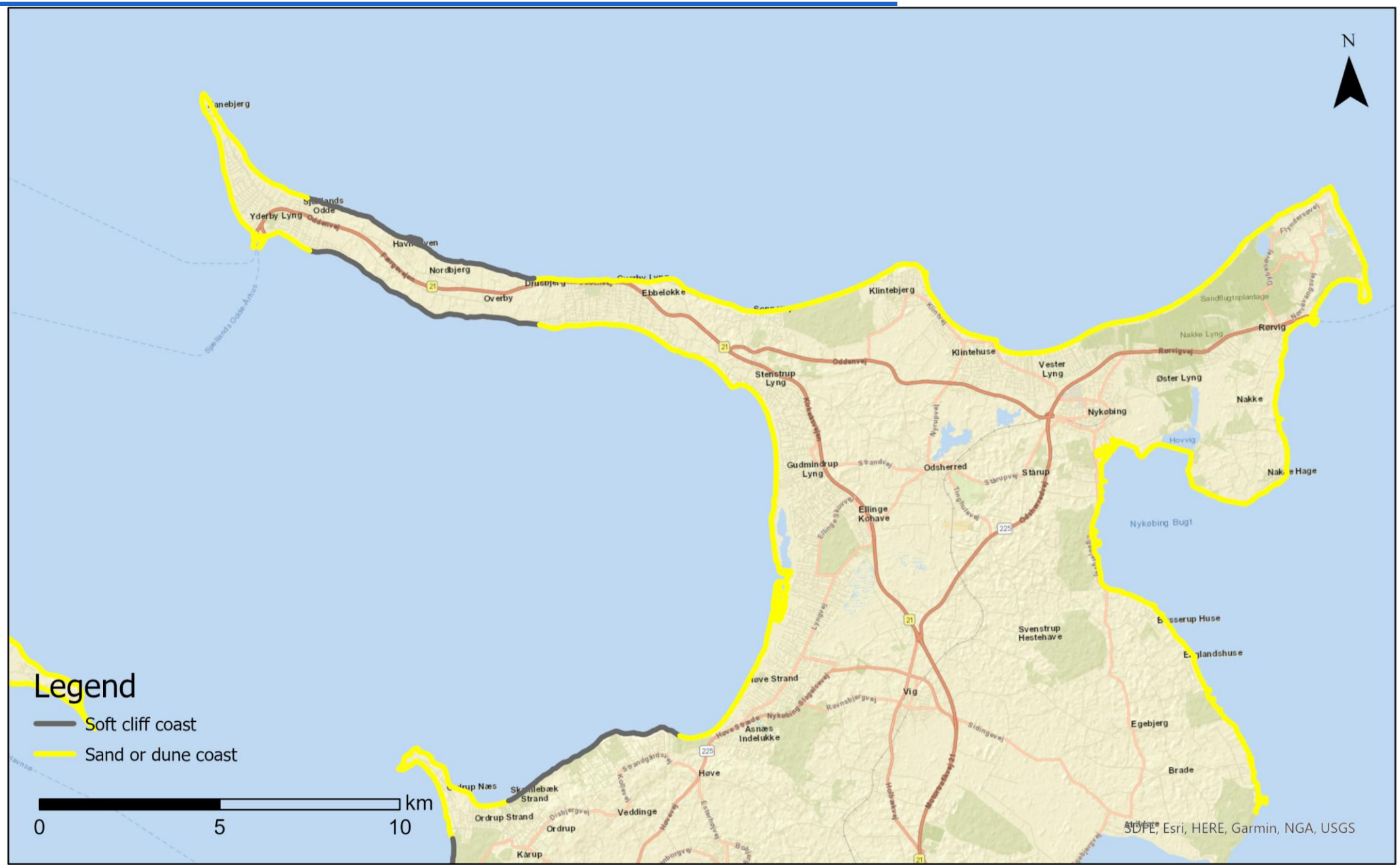
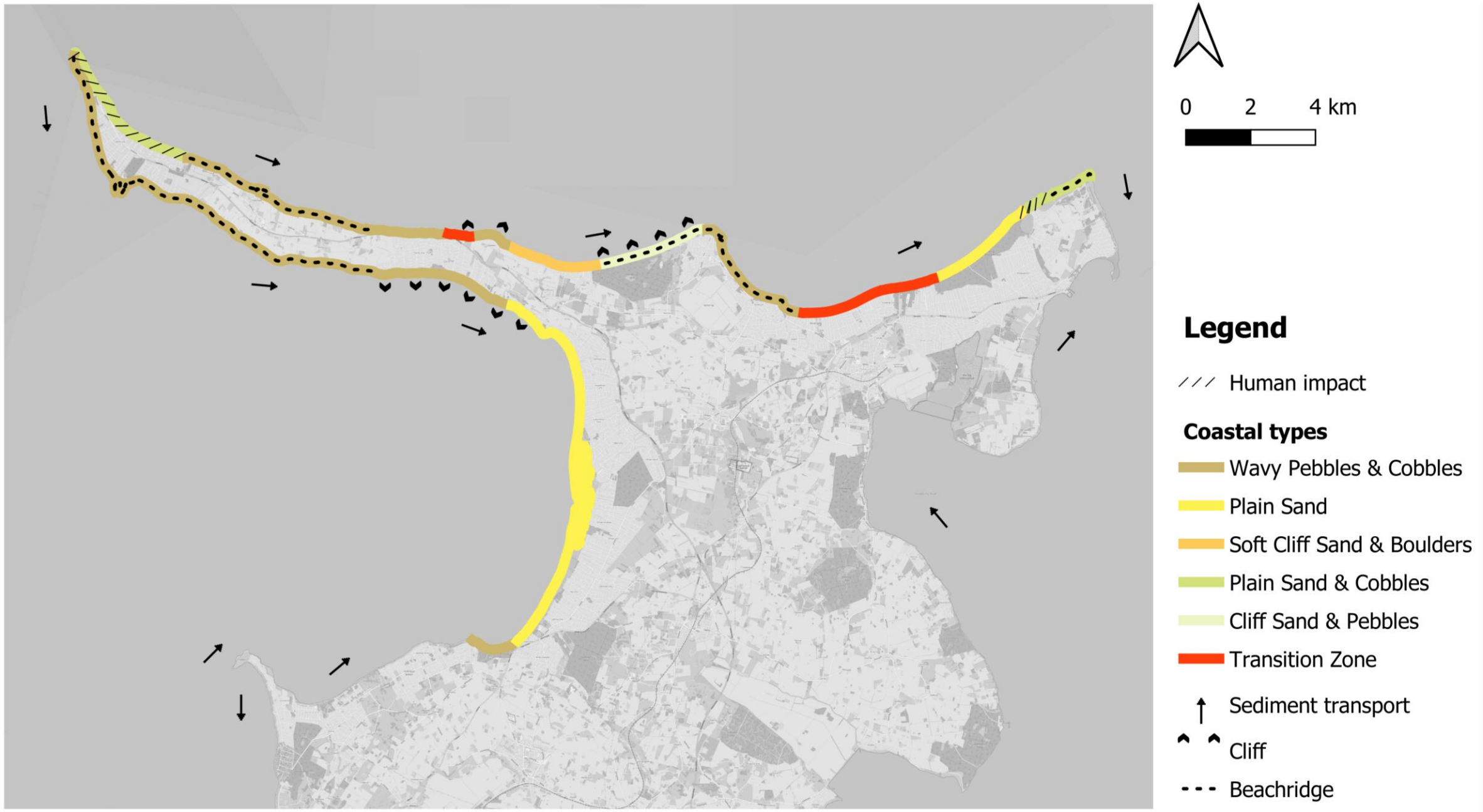
KYSTATLAS: COASTAL TYPES



KYSTATLAS: COASTAL TYPES



REFERENCES

- https://kortviseren.dk/
- https://www.meteociel.fr/
- https://kyst.dk/kyster-og-klima/vaerktoejer/kystatlas/

- Own pictures and transect

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FACULTEIT WETENSCHAPPEN

Thank you for your attention

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