Rewetting Landscapes in Odsherred Restoring Nature's Carbon Sinks

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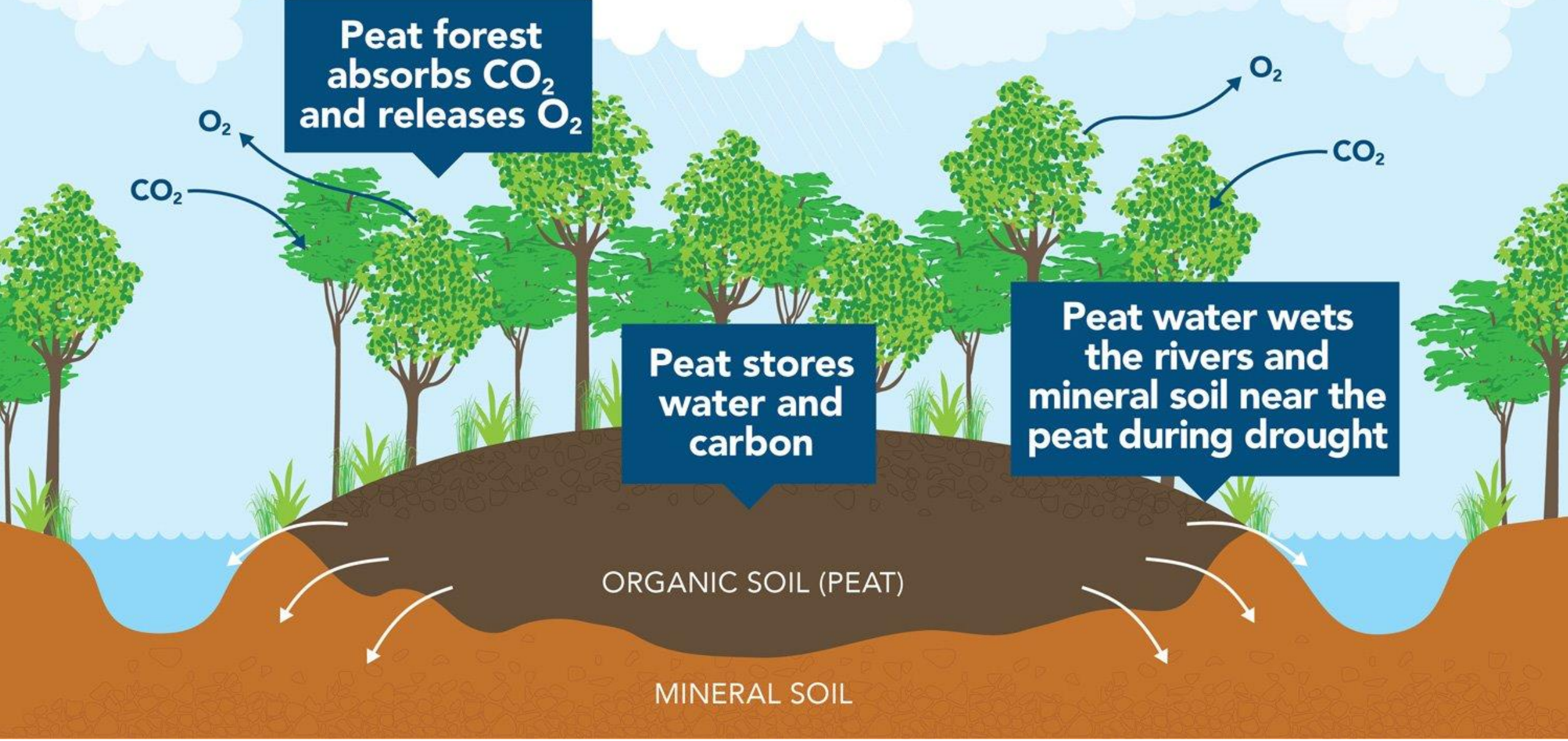


Context

Carbon sequestration in wetlands vs Emission of GHGs in drained peatlands

Research Questions and Objectives

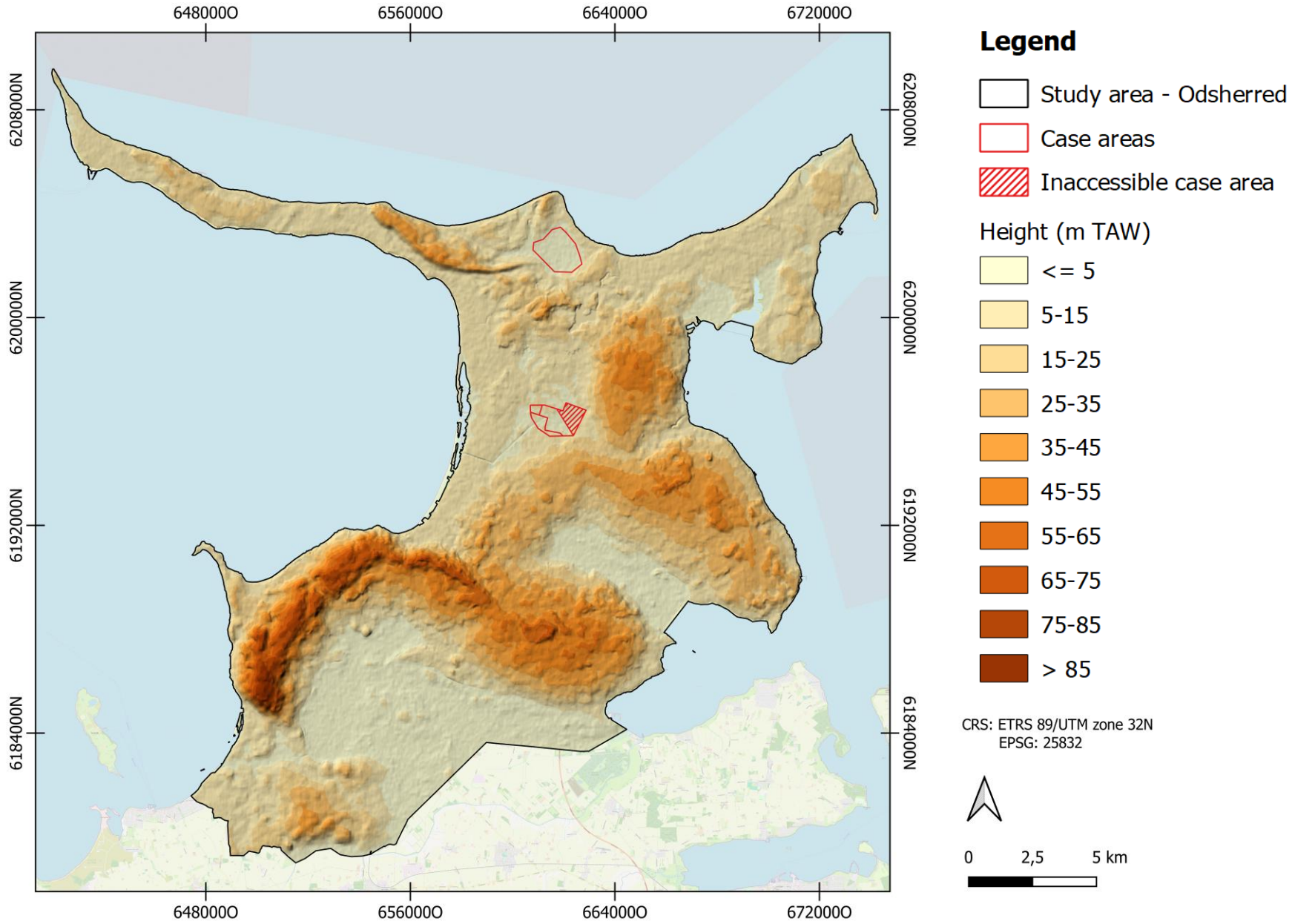
General research question

- Which areas in Odsherred are the most suitable for rewetting?

Sub-research questions

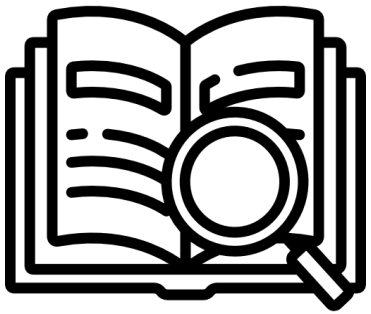
- Which factors affect the storage and release of greenhouse gases in the suitable areas?
- What is the impact of raising the groundwater table on greenhouse gas storage and release in the suitable areas?

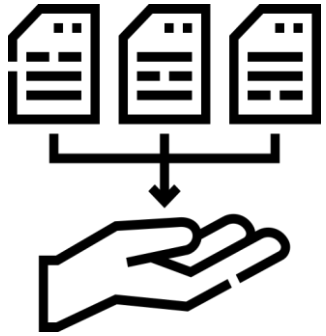
Methodology: Study Area

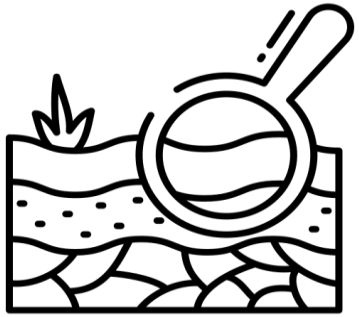


Methods

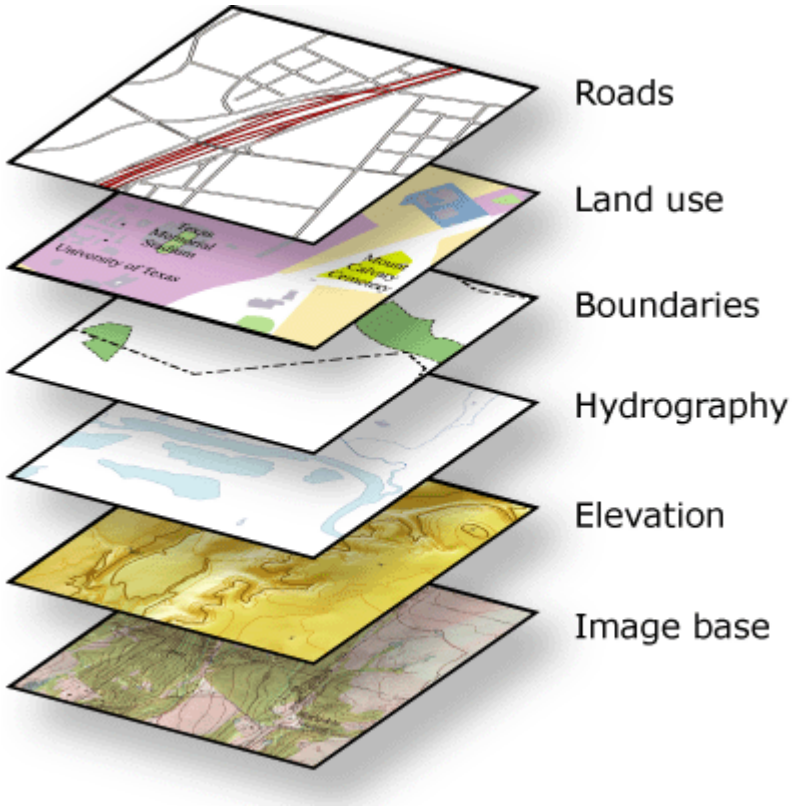
Literature study → Data collection → Modelling → Terrain work



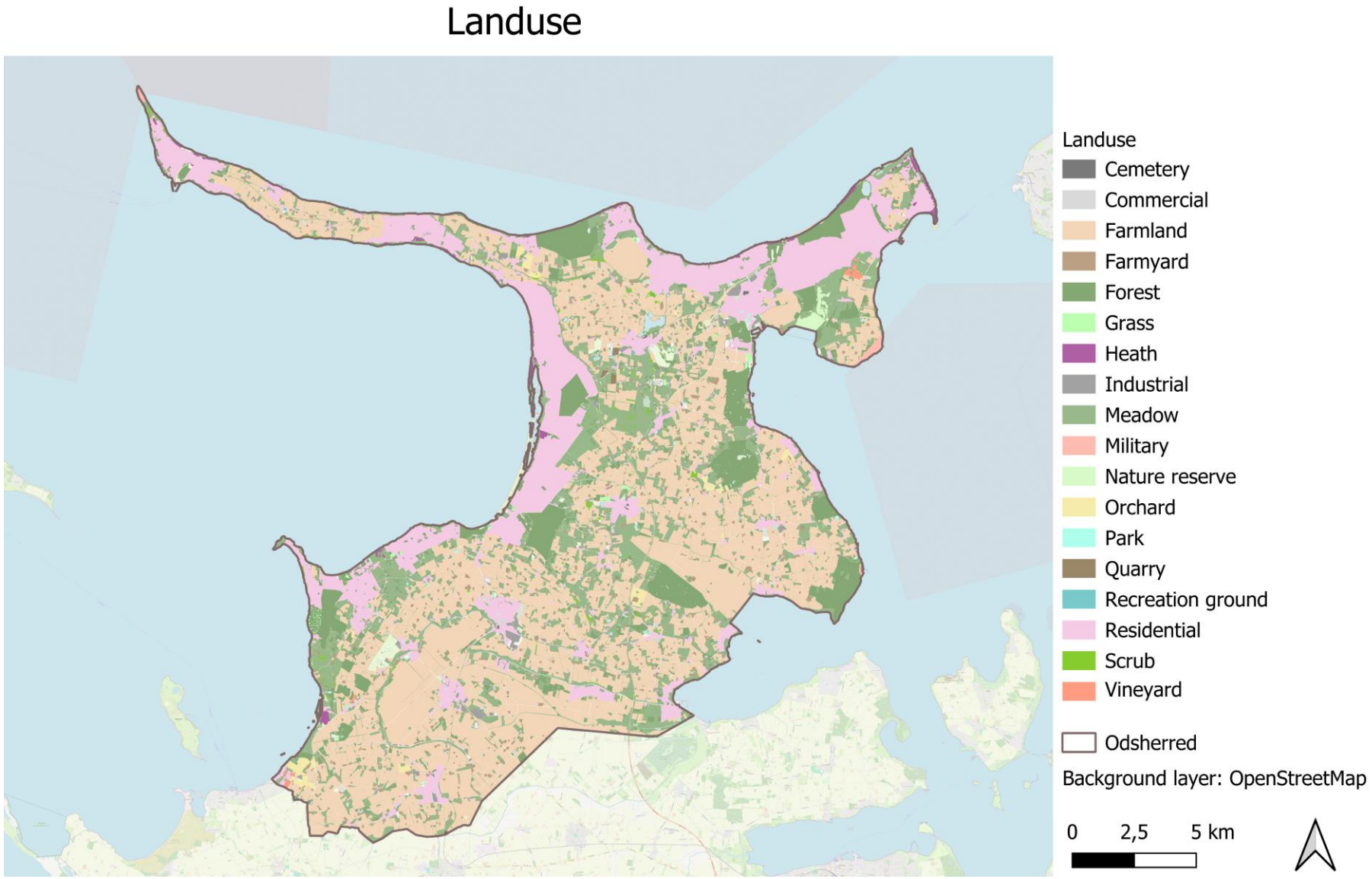




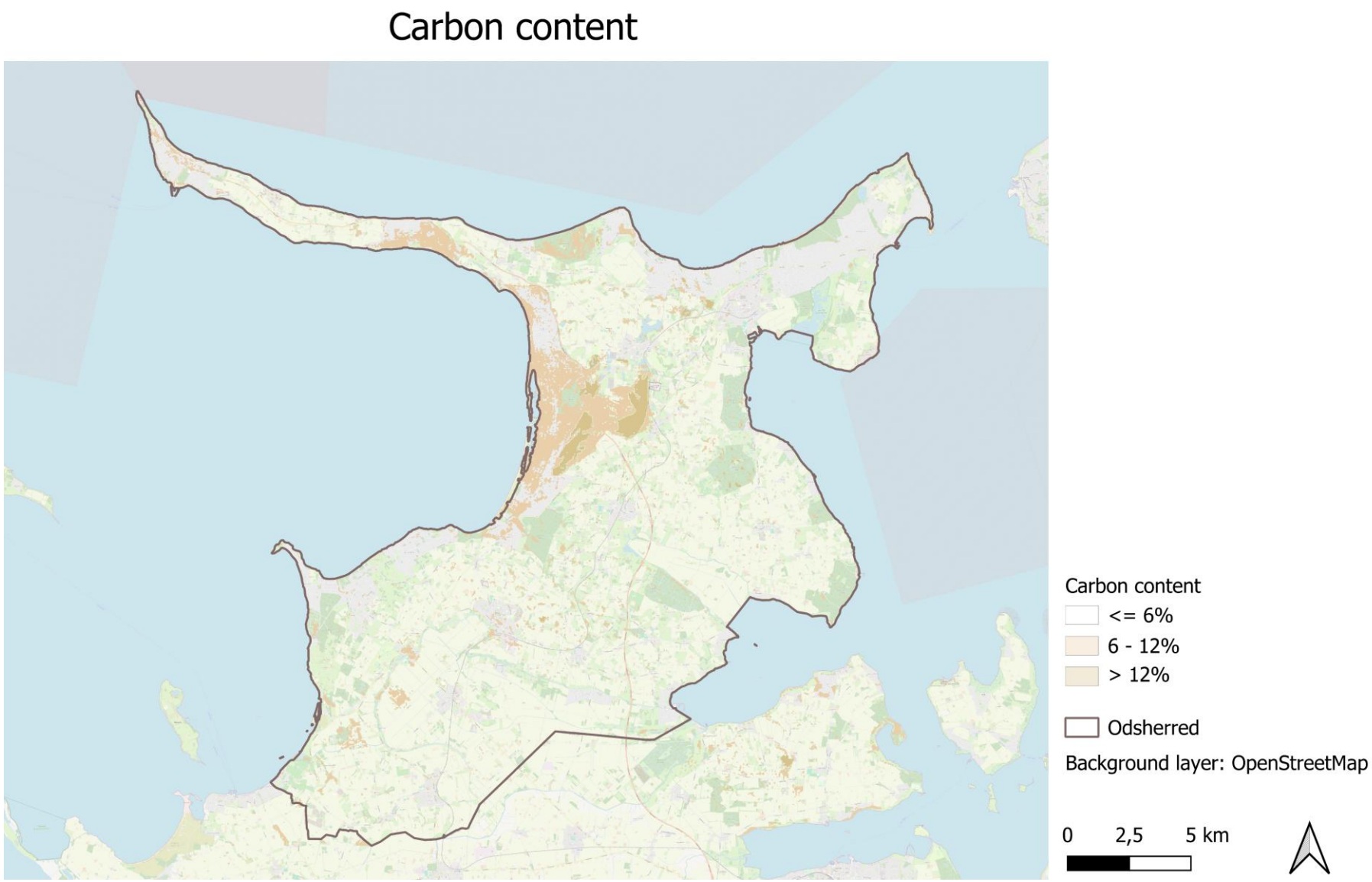
Modelling: multi-criteria analysis



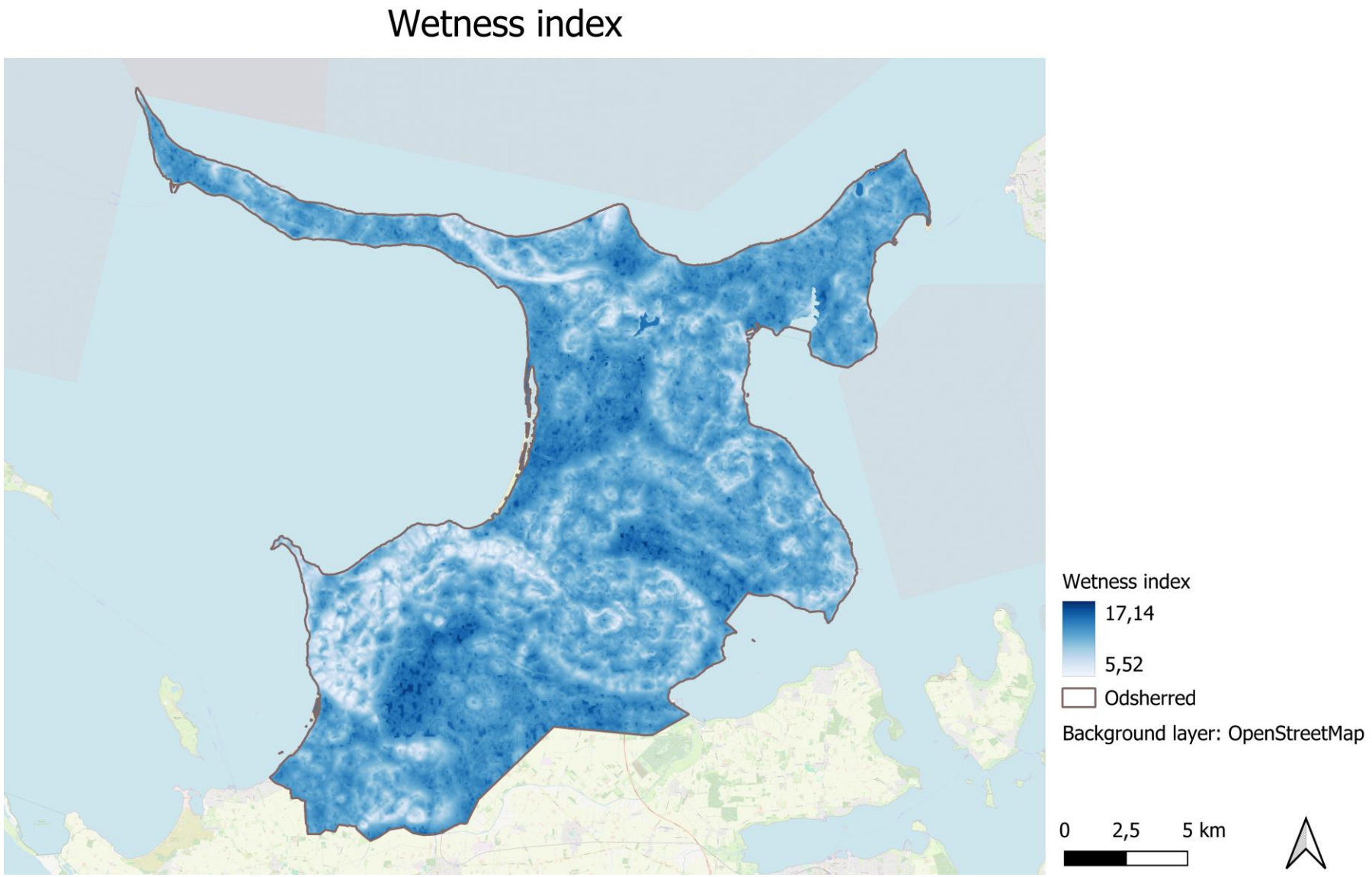
Data


Landuse
Landuse
Cemetery
Commercial
Farmland
Farmyard
Forest
Grass
Heath
Industrial
Meadow
Military
Nature reserve
Orchard
Park
Quarry
Recreation ground
Residential
Scrub
Vineyard
Odsherred
Background layer: OpenStreetMap
0
2,5
5 km

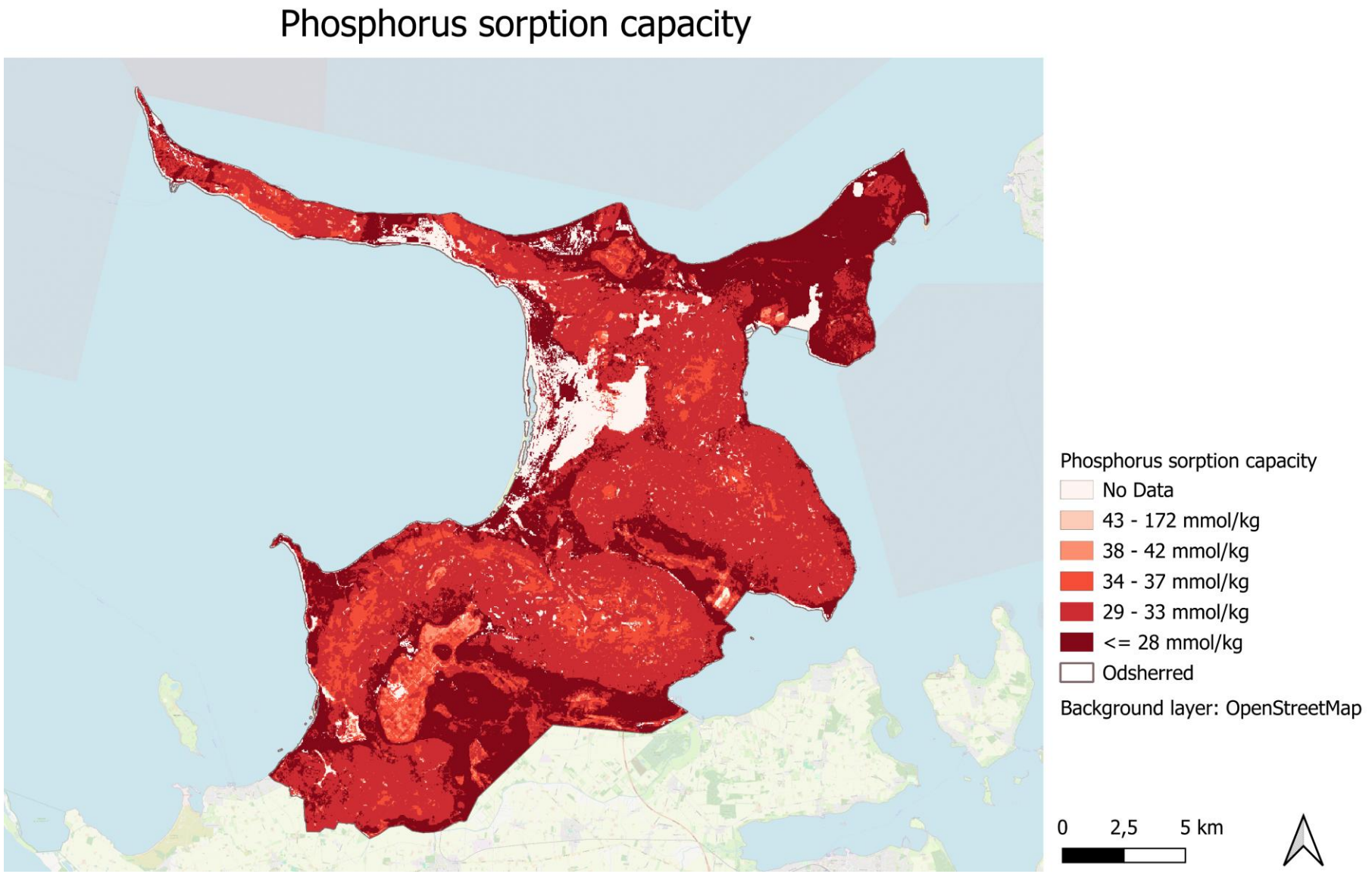
Data


Carbon content
Carbon content
<= 6%
6 - 12%
> 12%
Odsherred
Background layer: OpenStreetMap
0
2,5
5 km

Data

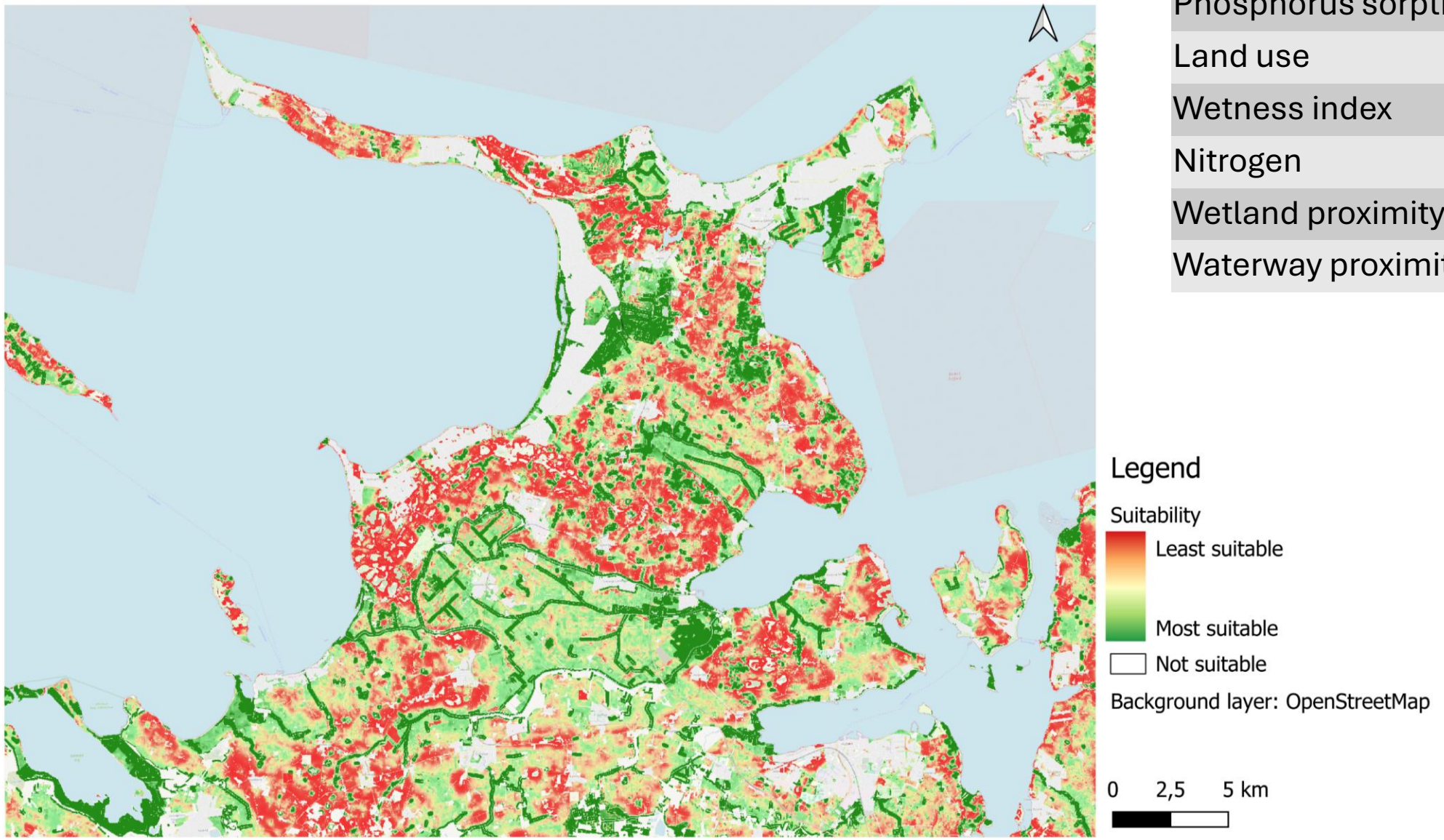

Wetness index
Wetness index
17,14
5,52
Odsherred
Background layer: OpenStreetMap
0
2,5
5 km

Data


Phosphorus sorption capacity
Phosphorus sorption capacity
No Data
43 - 172 mmol/kg
38 - 42 mmol/kg
34 - 37 mmol/kg
29 - 33 mmol/kg
<= 28 mmol/kg
Odsherred
Background layer: OpenStreetMap
0
2,5
5 km

Data

Suitability map for rewetting in Odsherred and surroundings



Factors	Weights
Carbon	0.16
Phosphorus sorption capacity	0.08
Land use	0.21
Wetness index	0.21
Nitrogen	0.13
Wetland proximity	0.08
Waterway proximity	0.13

Terrain work

Describing the landscape

Augering on site

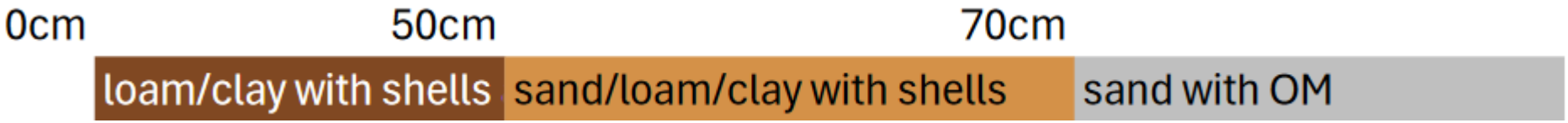
Measuring the bulk density

Results: Soil Profile

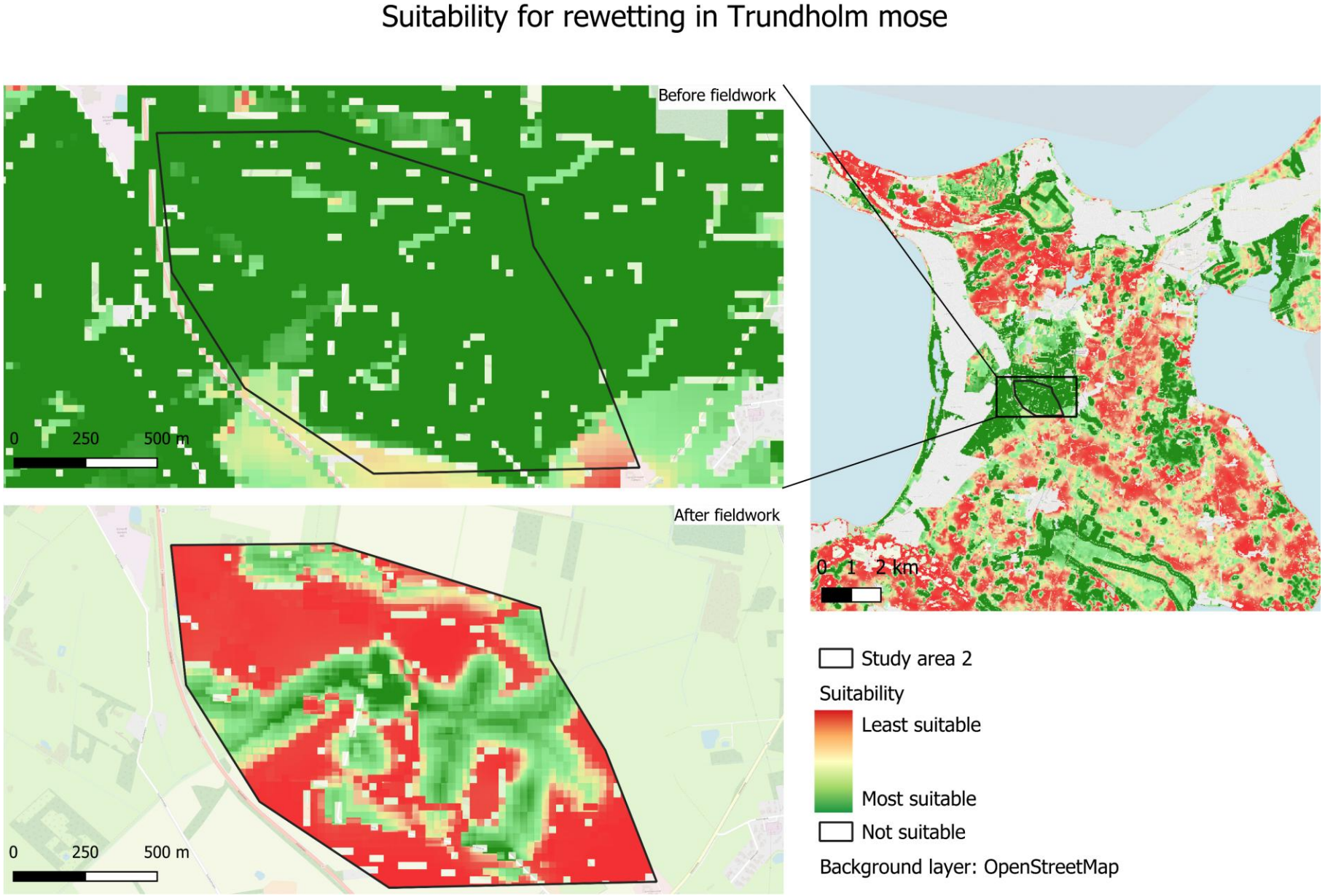
Trundholm Mose (Rewetted)

Trundholm Mose

Klinte Sø

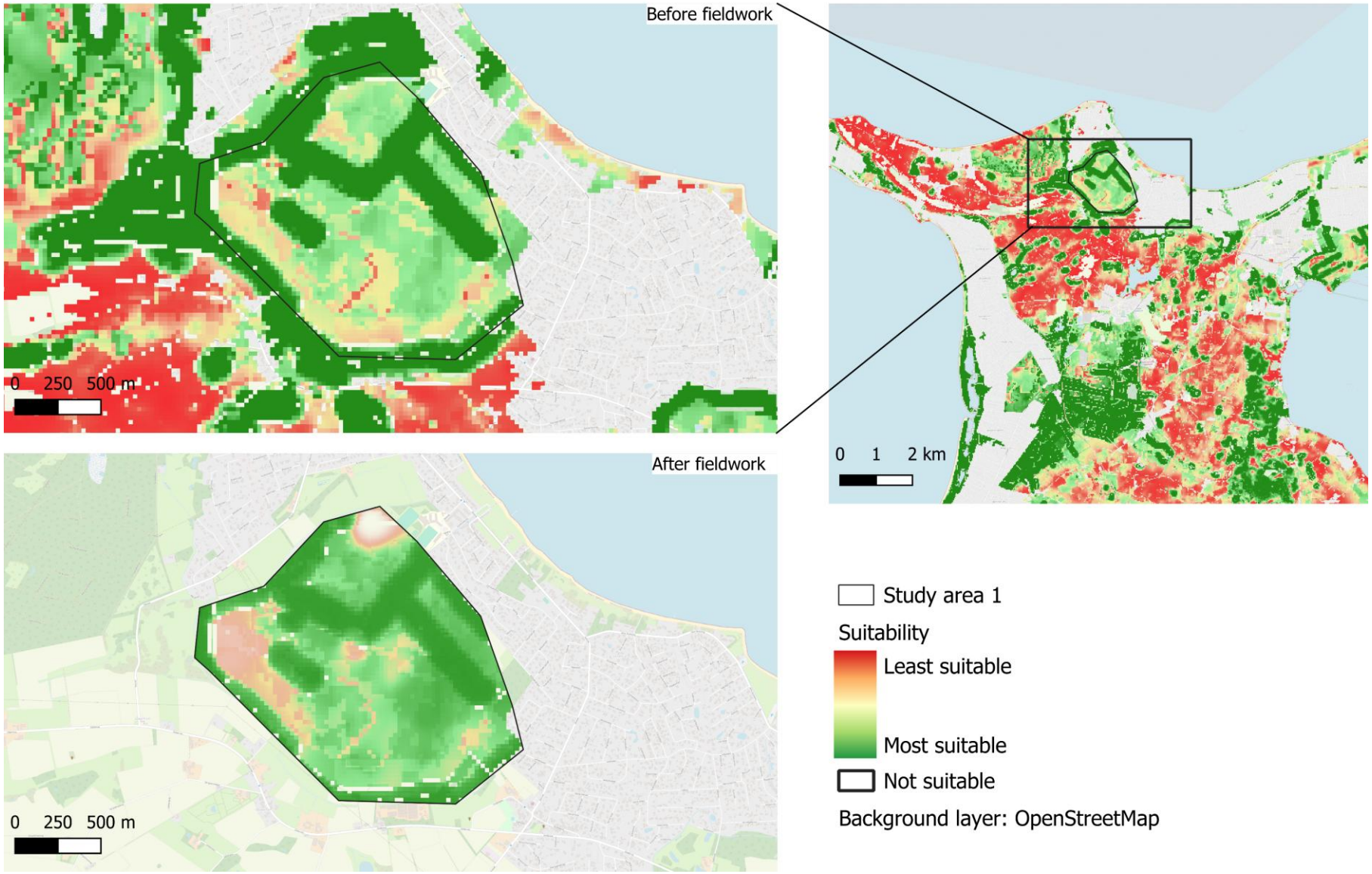


Results

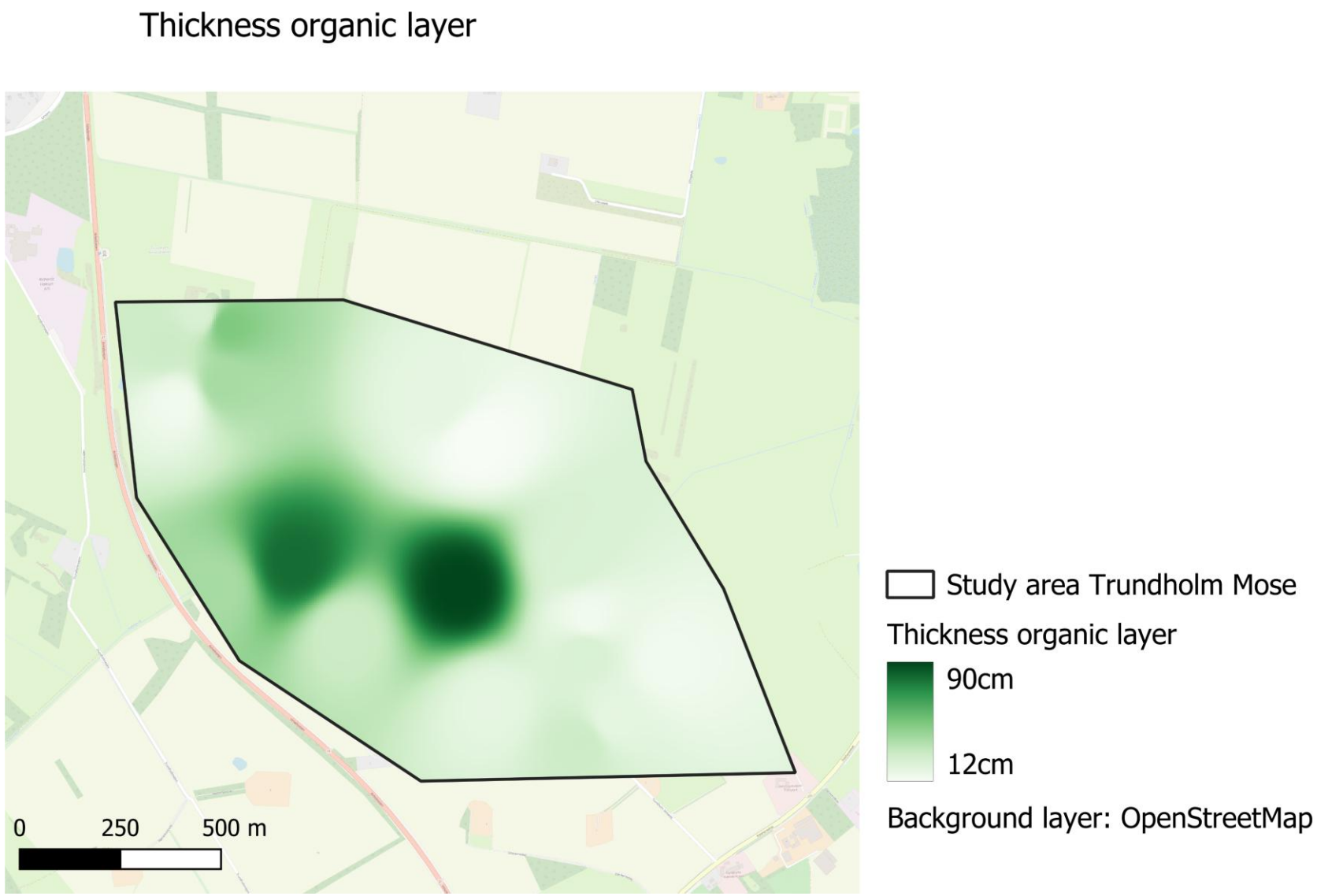

Suitability for rewetting in Trundholm mose
Before fieldwork
0 250 500 m
After fieldwork
0 250 500 m
0 1 2 km
Study area 2
Suitability
Least suitable
Most suitable
Not suitable
Background layer: OpenStreetMap

Results

Suitability for rewetting in Klinte So

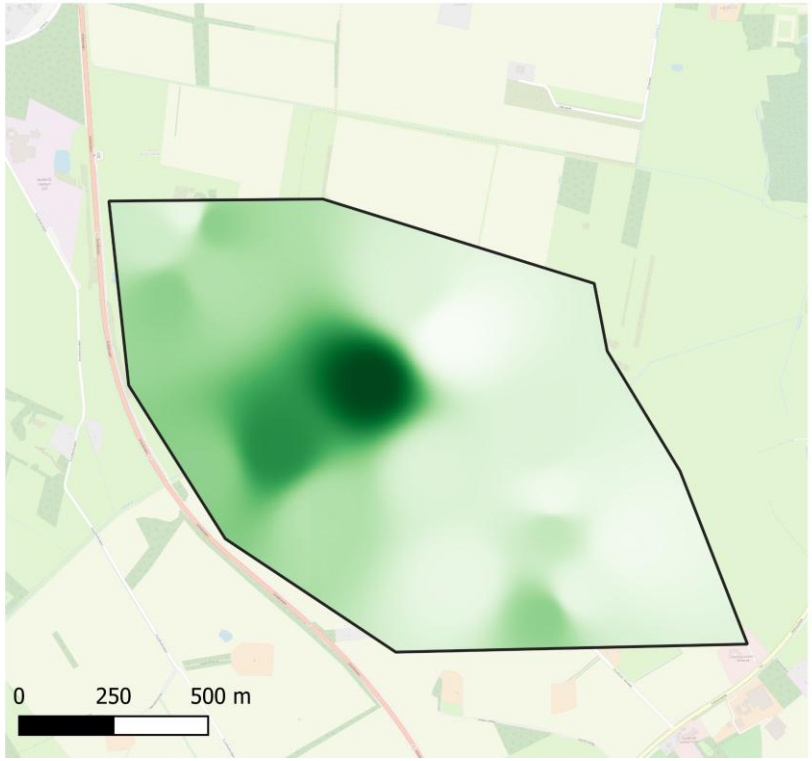


Results


Thickness organic layer
0
250
500 m
Study area Trundholm Mose
Thickness organic layer
90cm
12cm
Background layer: OpenStreetMap

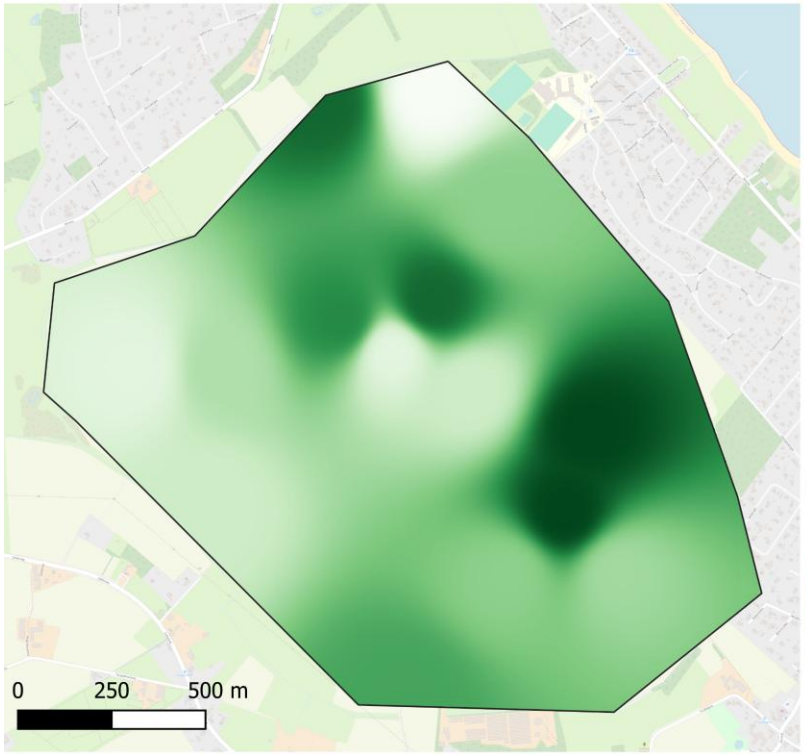
Results

Potential CO2 capturing when rewetting



Study area Trundholm Mose
Potential CO2 capturing
75.200 kg ha-1 yr-1
7.520 kg ha-1 yr-1
Background layer: OpenStreetMap

Potential CO2 capturing when rewetting



Study area Klinto So
Potential CO2 capturing
48.880 kg ha-1 yr-1
15.040 kg ha-1 yr-1
Background layer: OpenStreetMap

Strengths and Flaws

Strengths	Flaws
+ Generic and robust approach + Feasibility taken into account (MCA) + Terrain validation + Holistic approach: describing the landscape	- Socio-economic consequences not taken into account - Sampling bias in space and time - No direct determination of GHG emissions and organic carbon

Conclusions

Highest rewetting potential	Impactful factors	Effect higher watertable
• High groundwater table • Low organic carbon • Trundholm Mose • Klinte So	• Land use • GWT • Organic carbon • Phosporus sorption capcity • Nitrogen • Wetness index • Proximity of water	• More carbon storage • Less GHG emission


Discussion