Peat soil reserves and losses in the East Anglian Fens

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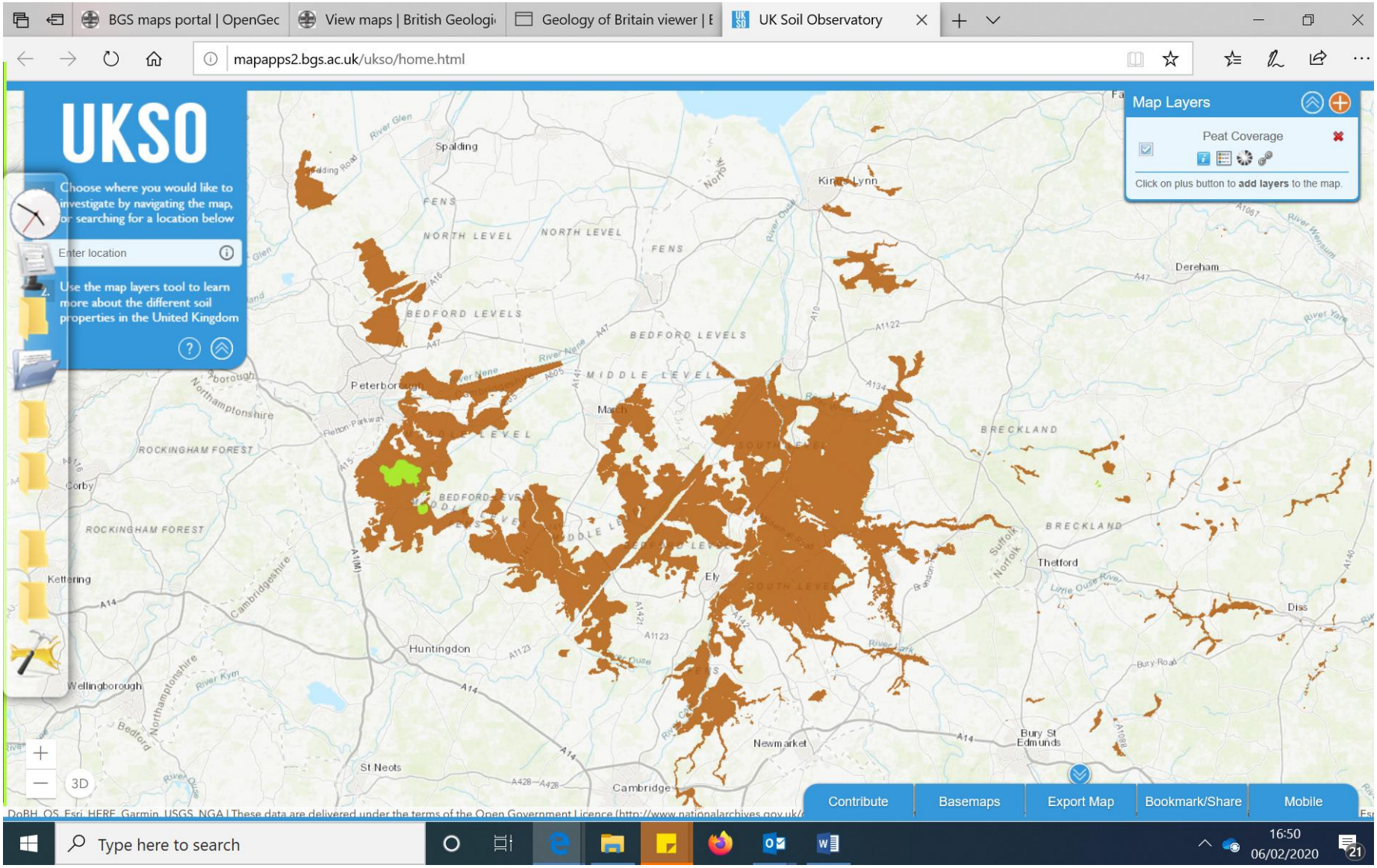
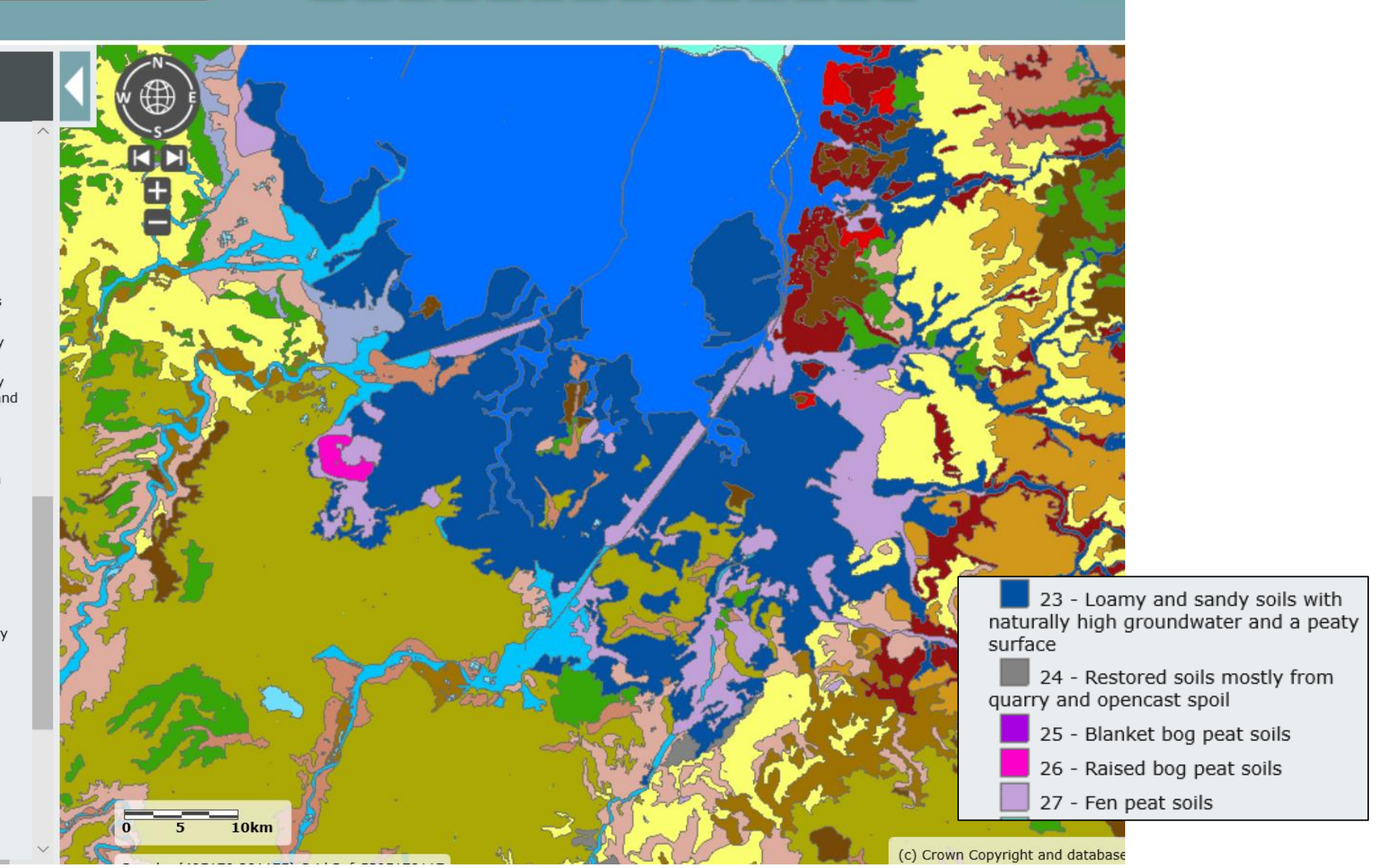
Overview

- Sources of spatial mapping of peat soils and their depth
- Peat wastage
- Peat extent

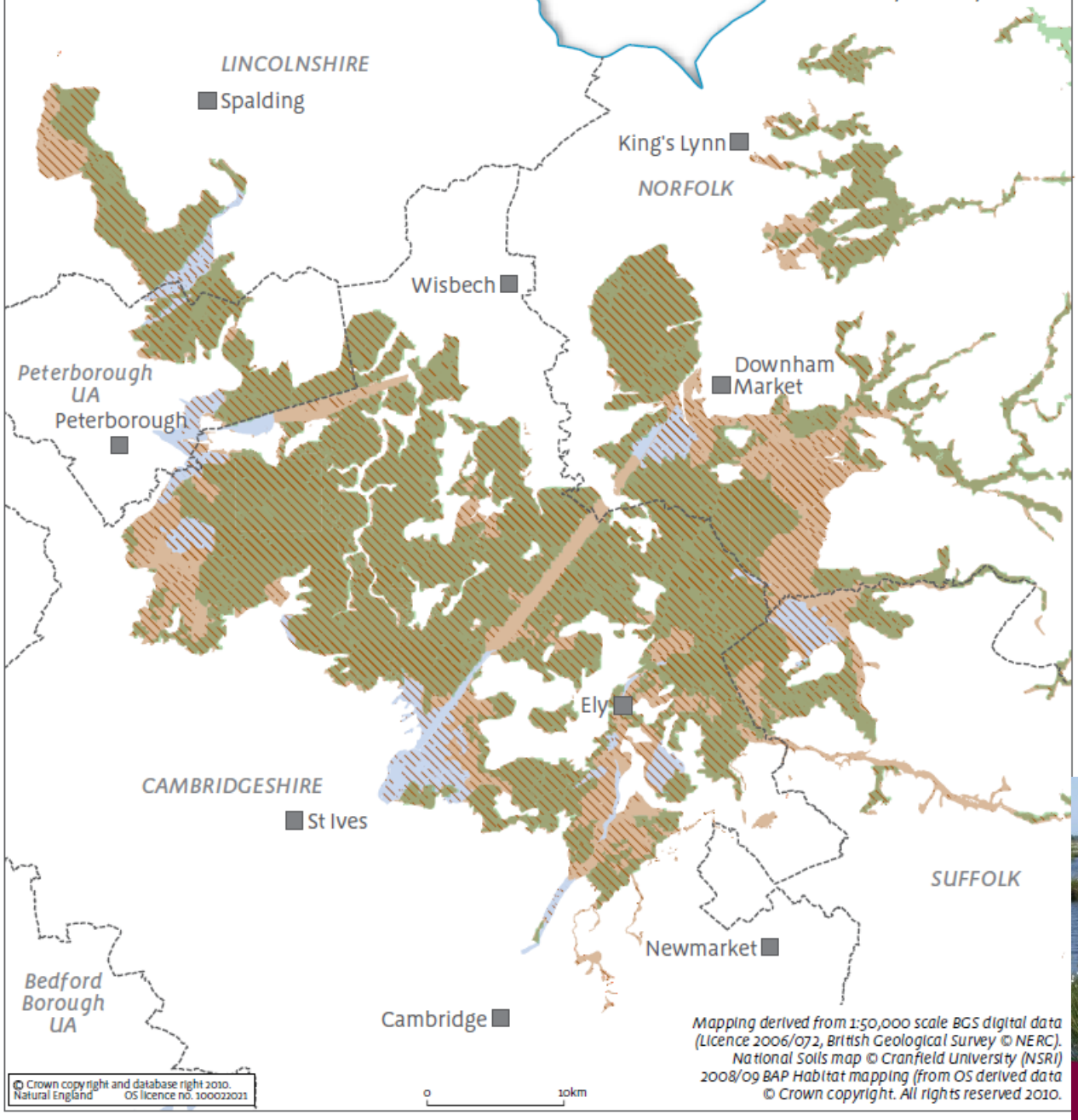


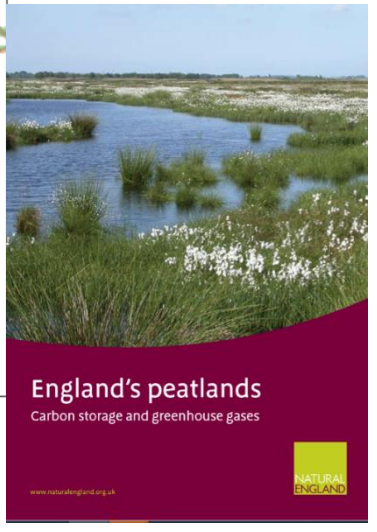
"Provides an indication of the presence of peat at a scale of 50 m resolution"
Derived from BGS Geology Surface dataset version 8.24

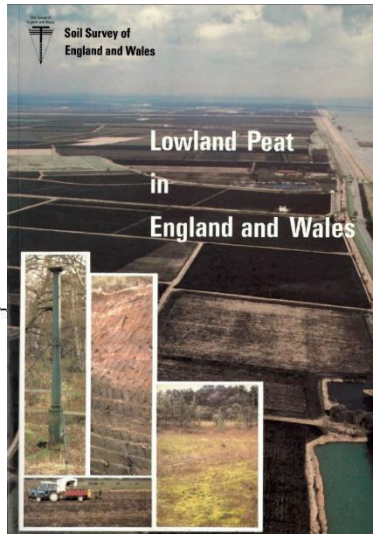


1:250,000 scale National Soil Map of England and Wales

Peat soils: more than 40 cm of organic material in the upper 80 cm


LINCOLNSHIRE
Spalding
King's Lynn
NORFOLK
Wisbech
Peterborough UA
Peterborough
Downham Market
Ely
CAMBRIDGESHIRE
St Ives
SUFFOLK
Newmarket
Bedford Borough UA
Cambridge
Cultivated peatland (includes temporary grass)
Wasted peat
Deep peaty soils
Soils with peaty pockets
County boundary
© Crown copyright and database right 2010. Natural England OS licence no. 100022021
0
10km
Mapping derived from 1:50,000 scale BGS digital data (Licence 2006/072, British Geological Survey © NERC). National Soils map © Cranfield University (NSRI) 2008/09 BAP Habitat mapping (from OS derived data © Crown copyright. All rights reserved 2010.


England's peatlands
Carbon storage and greenhouse gases
NATURAL ENGLAND



Published in 1987

Legend
- Friskney (1985)
- Stilton (1981)
- Ely (1975)
- Chatteris (1975)
- Cambridge (1966)
- Cambridge and Ely (1976)
- Boston and Spalding (1990)
- Remaining areas (1984)
- Indicative Fenland extent

N

10 0 10 20 Kilometers

Most soil mapping is > 35 years old

Peat wastage

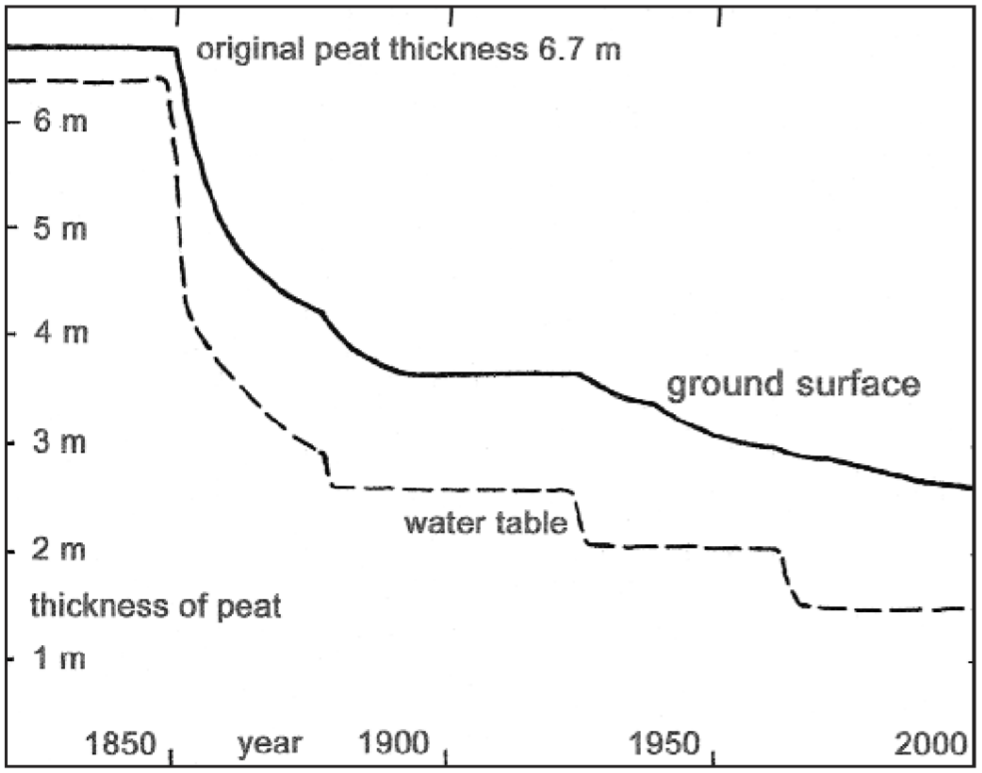
Consolidation

Compression

Oxidation

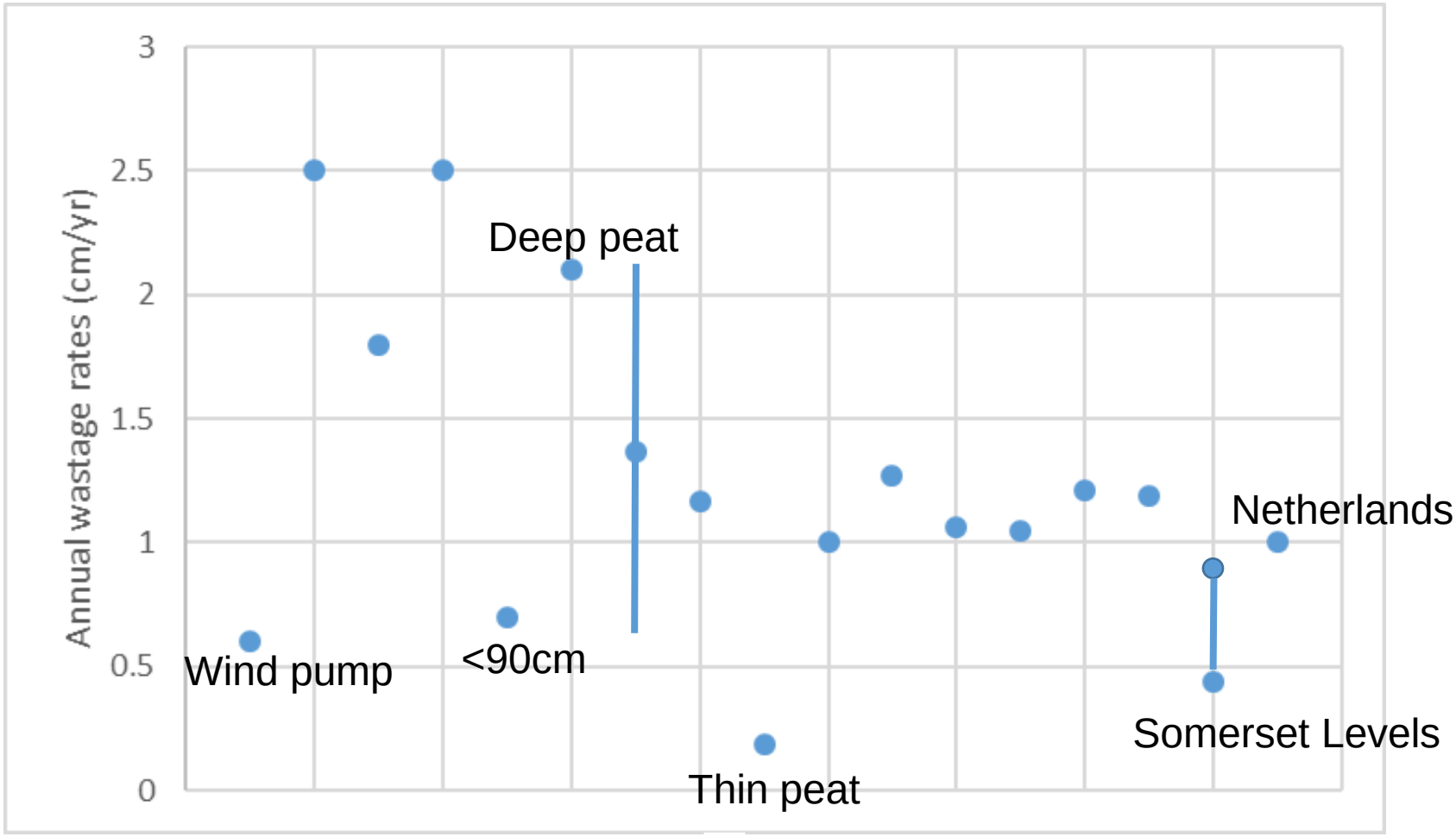
Wind erosion

Crop offtake



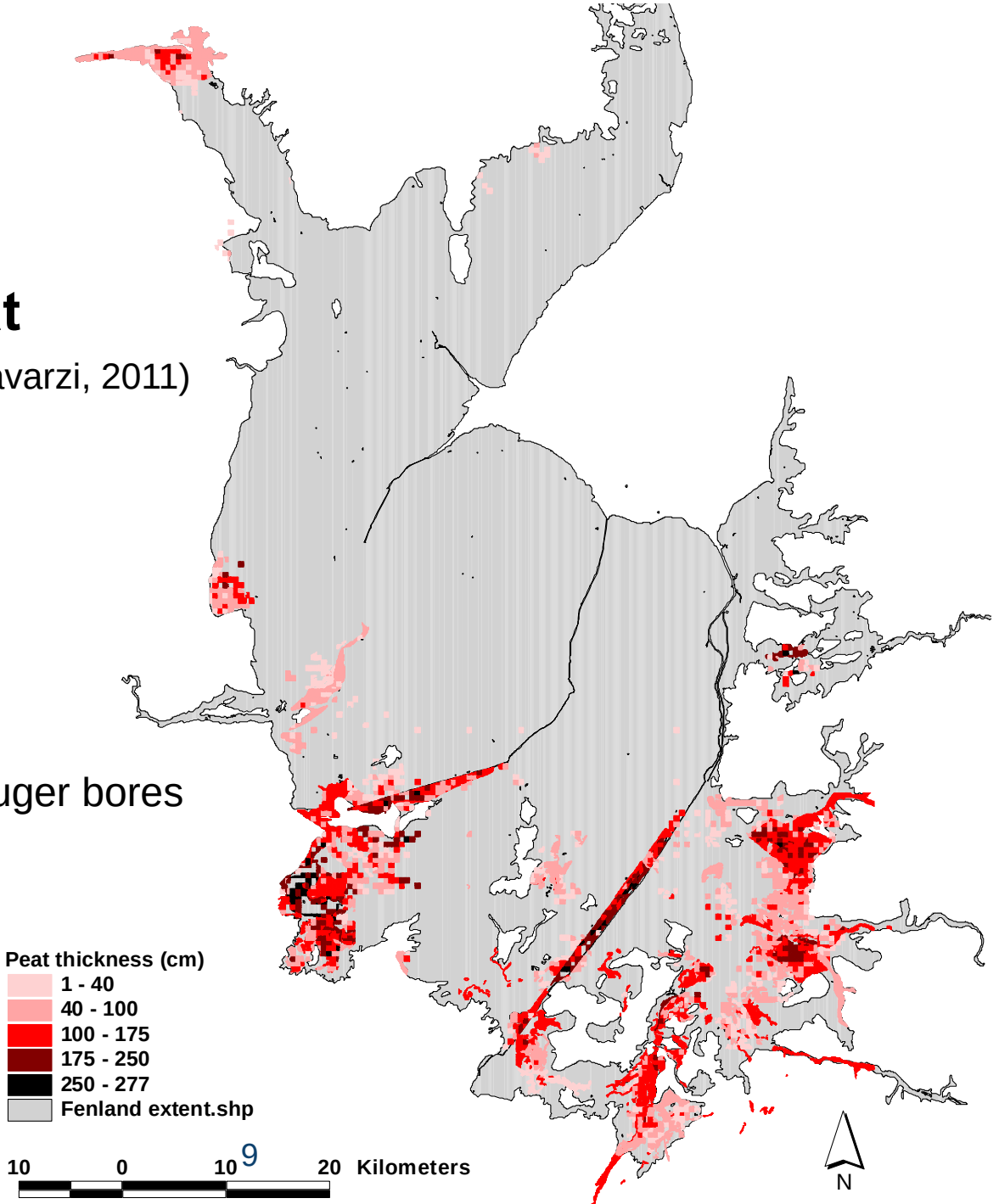
(Waltham, 2000)

Estimated peat wastage rates from literature



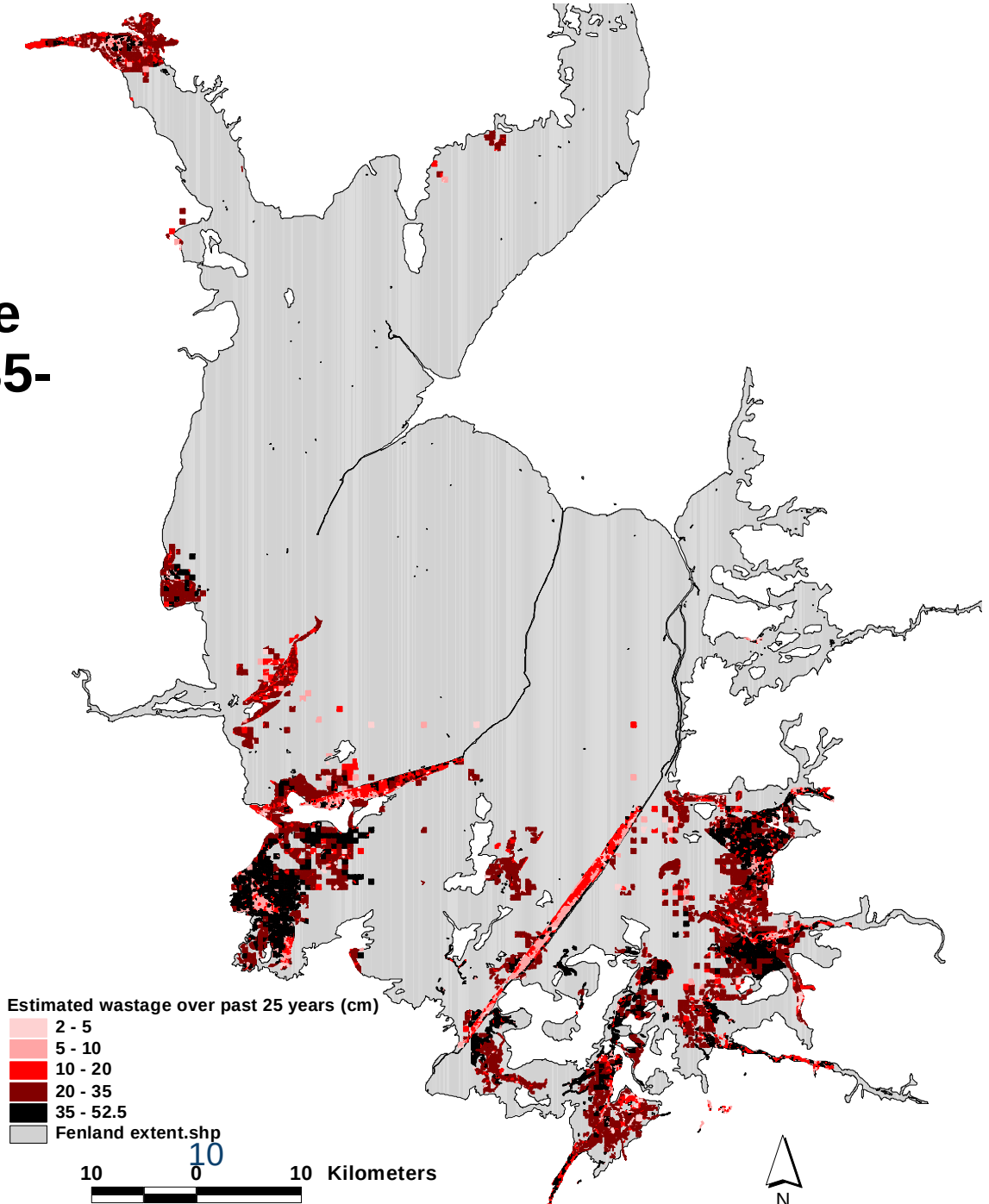
Estimated 1980's peat thickness (Holman & Kechavarzi, 2011)

Integration of soil maps and auger bores



Estimated peat wastage over past 25 years (1985-2010)

Literature-based wastage rates applied to simplified Landcover Map classes (with soil profile modifiers)



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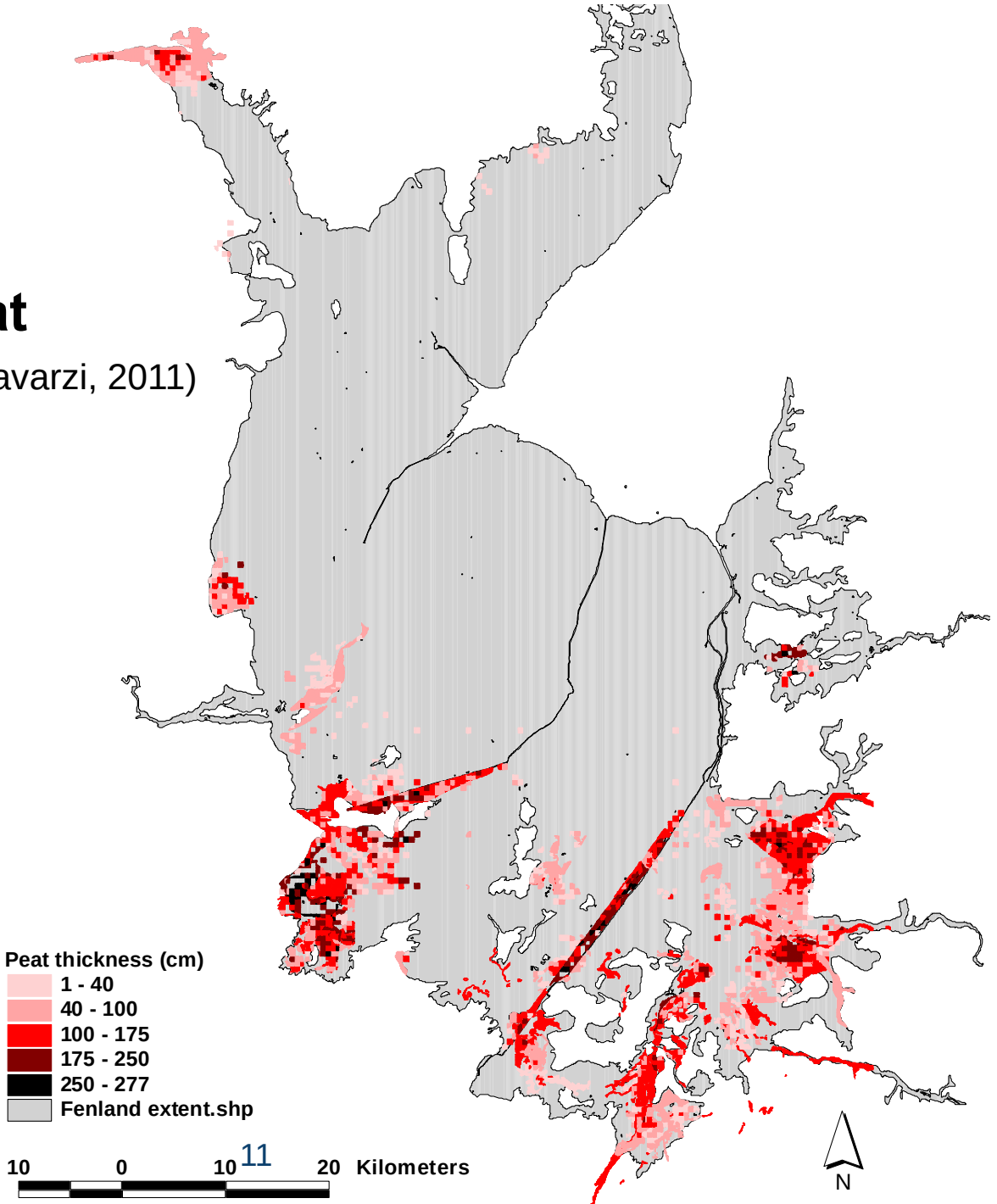
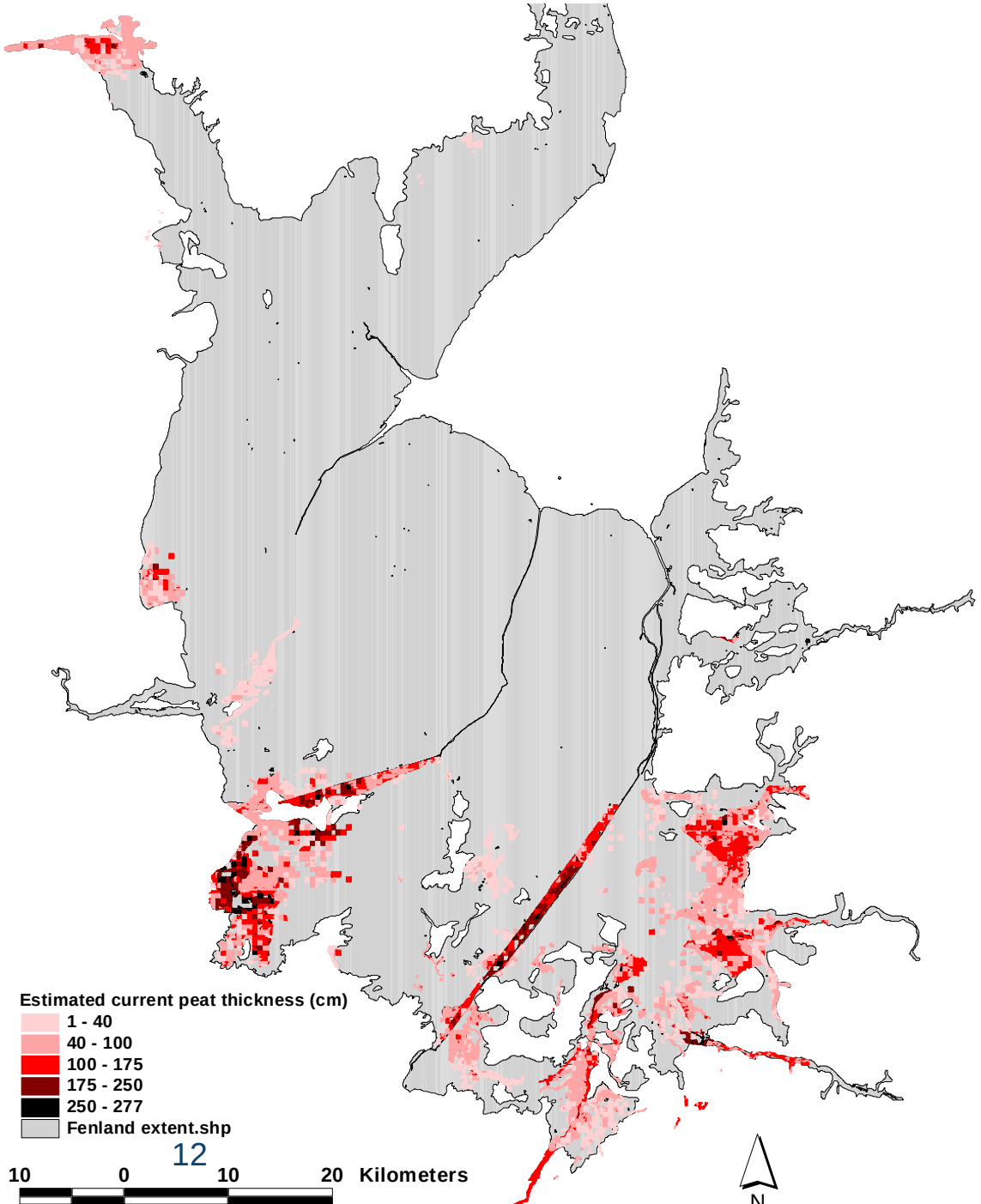


Estimated current (2010) peat thickness

(Holman & Kechavarzi, 2011)



Concluding comments

- Current peat extent and depth estimated from available soil mapping, auger bores and literature-based wastage rates

- Estimates are highly uncertain
  - Age and scale of soil data
  - Lack of landuse history
  - Lack of data on drainage intensity (control of watertable depth)

- Important implications for peatland management and the upscaling of field-scale emissions studies

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What is peat / what is a peat soil?

Mapping organisations

British Geological Survey

- Peat: “partially decomposed mass of semi-carbonized vegetation which has grown under waterlogged, anaerobic conditions, usually in bogs or swamps”
- “…Usually the map shows ….the lithology of the top metre of deposit”

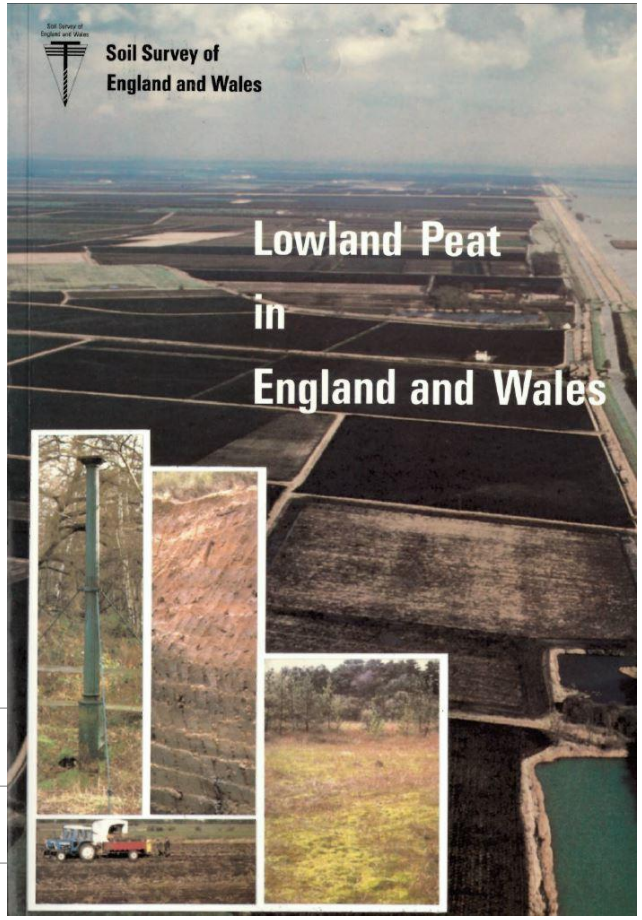
  (McMillan and Powell, 1999. BGS Rock Classification Scheme Vol 4: natural superficial deposits)

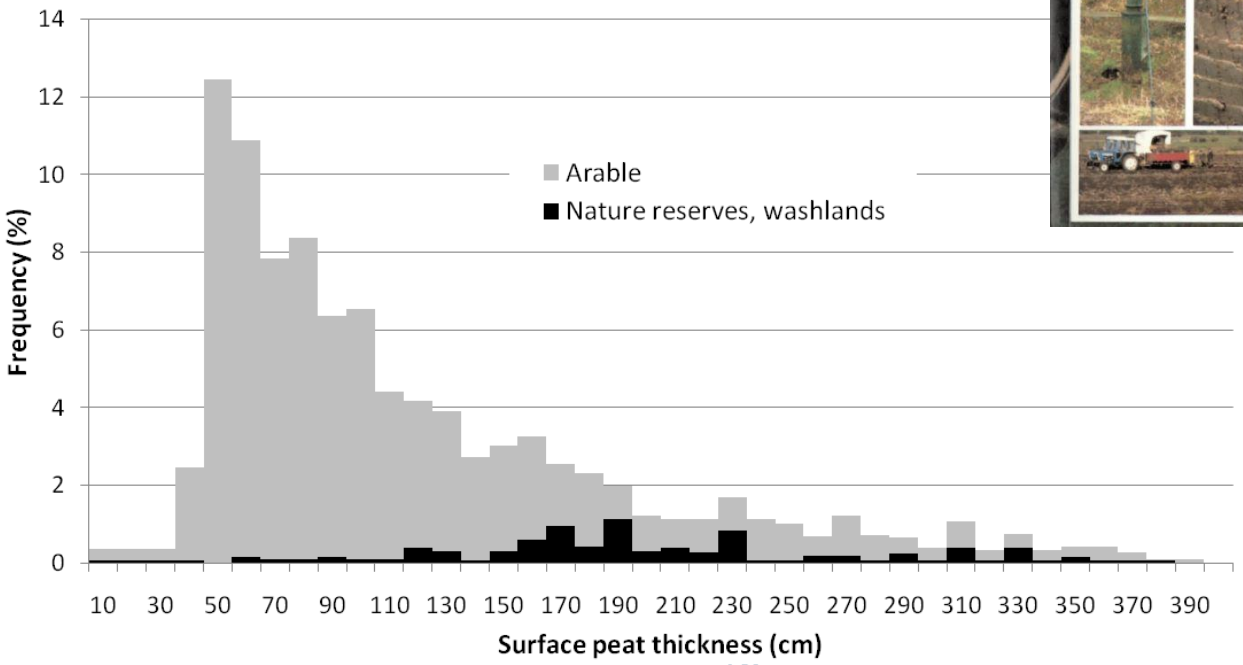
Soil Survey of England Wales

- Peat: > 50% organic matter (LOI) [loamy / sandy peat > 20% OC / 35%OM]
- Peat soils: more than 40 cm of organic material in the upper 80 cm

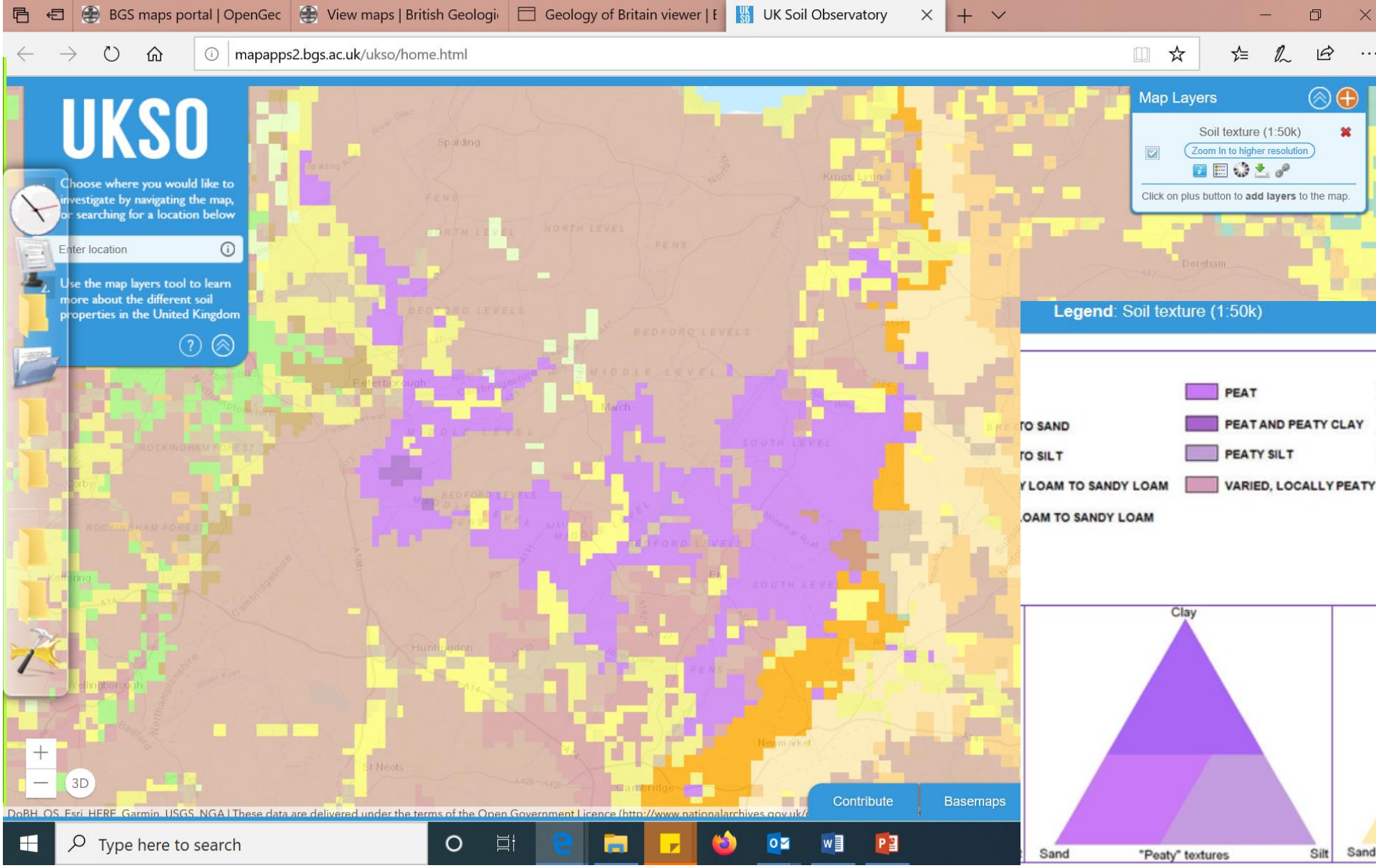
Lowland peat survey

Most comprehensive dataset on peat thickness





Published in 1987



Derived from archive GBASE and geotechnical samples held by BGS
Expert judgement used where sample data are not available

Assumed peat wastage rates

Peat thickness	Land cover		
	Intensive arable (drained and cultivated)	Intensive grassland (drained)	Semi-natural (largely undrained)
Thick (> 1m)*	2.1	0.8	0.4
Thin (< 1 m)	1.3	0.7	0.1

Presence of Fen Clay within profile: -10%
Predominantly fibrous peats: -2%