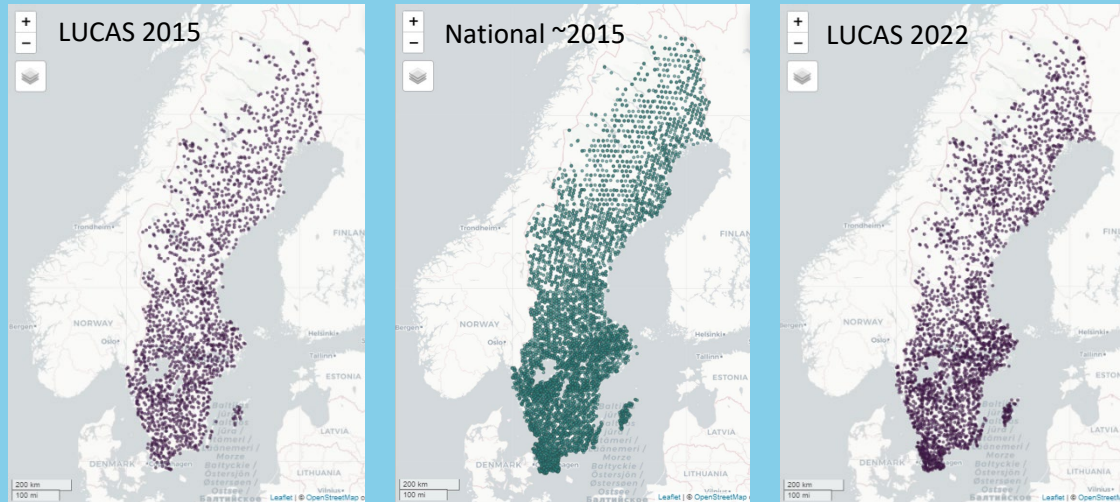# COMPARISON OF LUCAS AND THE NATIONAL SOIL MONITORING PROGRAMMES IN SWEDEN

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EJP SOIL
European Joint Programme

Background

A review of existing soil monitoring systems that was done within EJP SOIL (WP6), demonstrated that soil monitoring systems across EU countries (including LUCAS) are quite different (e.g. sampling strategies and methods, analysis of soil samples…)
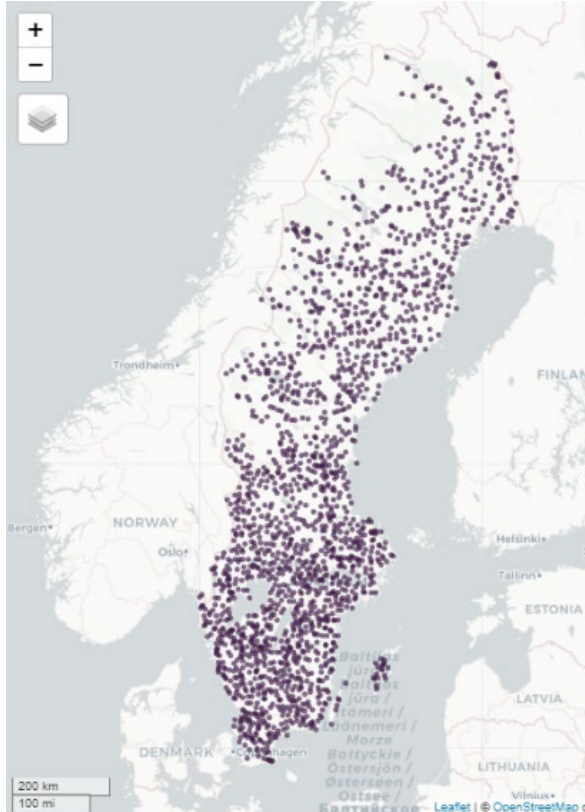- Deliverable 6.3, https://ejpsoil.eu/fileadmin/projects/ejpsoil/WP6/EJP_SOIL_Deliverable_6.3_Dec_2021_final.pdf

Two exercises were developed (lead by INRAE)
- The comparison of LUCAS dataset with national data, country by country
  - Present some of the Swedish results
  - Paper soon to be submitted
- A double sampling exercise to develop transfer functions, in collaboration with JRC
  - Analytical procedures: LUCAS samples analysed at "LUCAS lab" and national lab – 17 countries
  - Sampling and analytical procedures: sampling according to both protocols – 6 countries
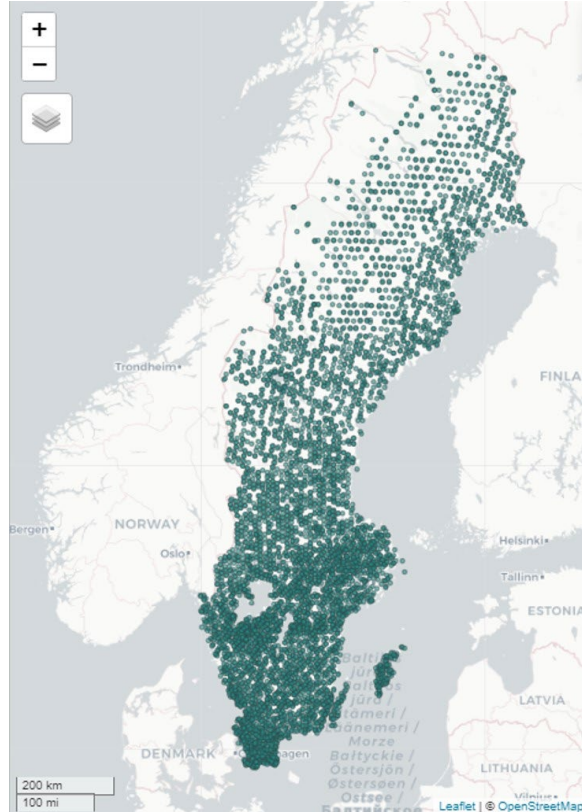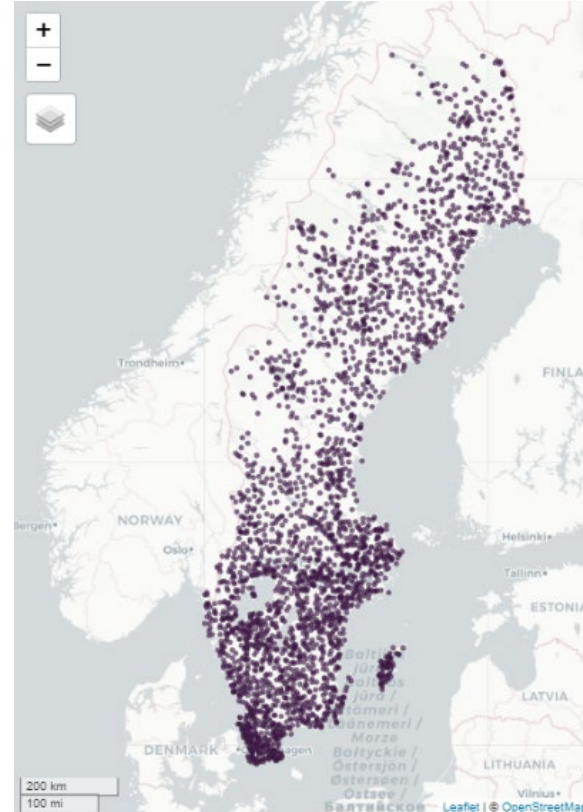
Sample density and distribution

LUCAS 2015

National ~2015

LUCAS 2022

Breakdown of land use in 2020

Open mire and other land 22%
Built-up and developed land 3%
Agricultural land 7%
Forest land 68%

SCB Statistics Sweden

	LUCAS 2015	National ~2015	LUCAS 2022
Total:	1 847	6 327	2 845
Cropland:	154 (8%)	2 030 (32%)	759 (27%)
Forest:	1 496 (81%)	4 297 (68%)	1 463 (51%)

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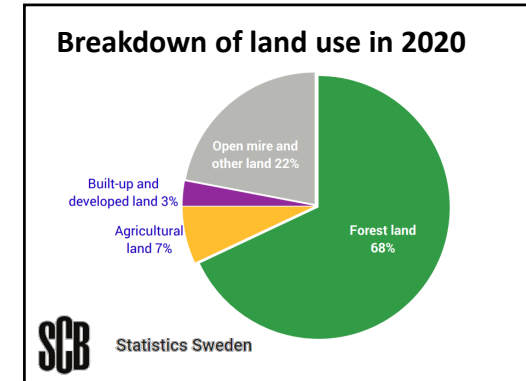
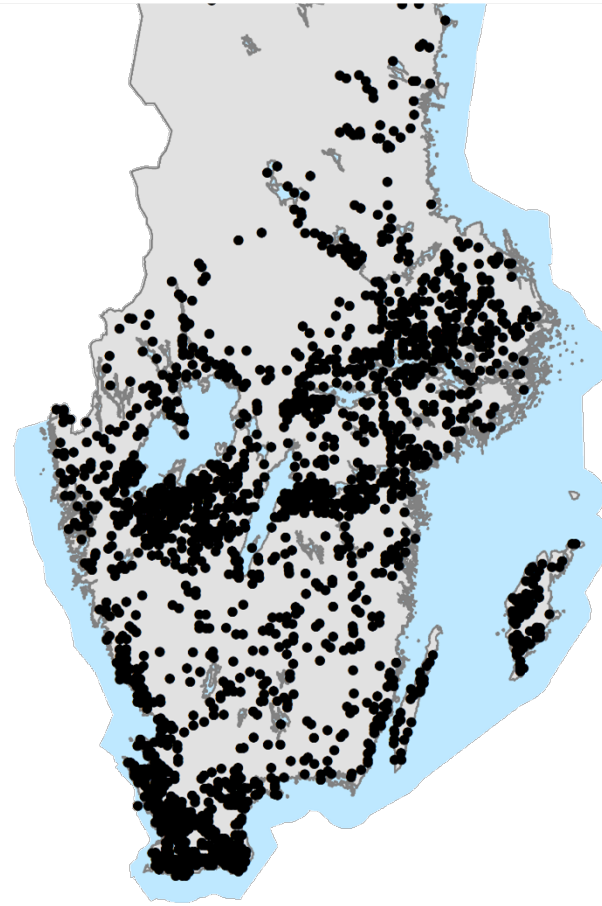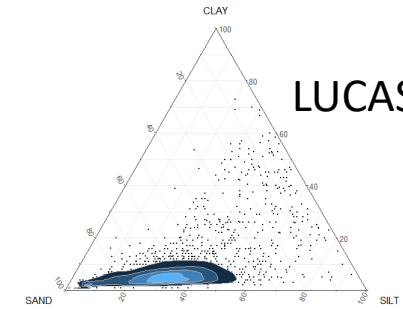# Soil type and land use
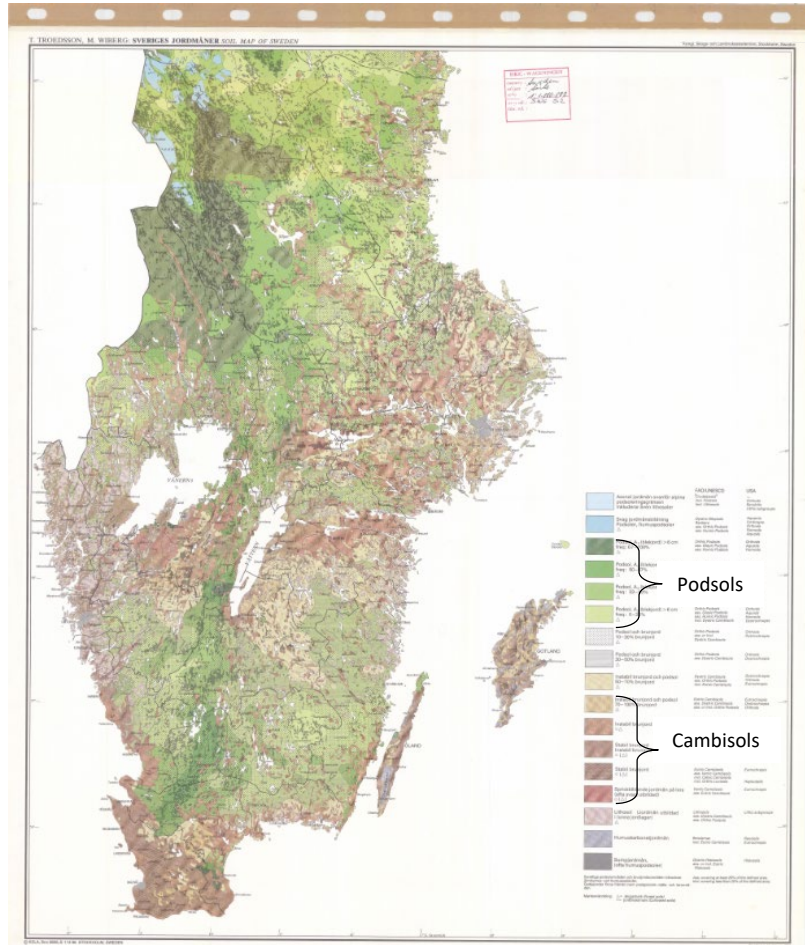
1986, Troedsson, T.; Wiberg, M., KSLA, ESDAC

Soil samples in agricultural land

LUCAS all

National crop

Podsols

Cambisols

EJP SOIL
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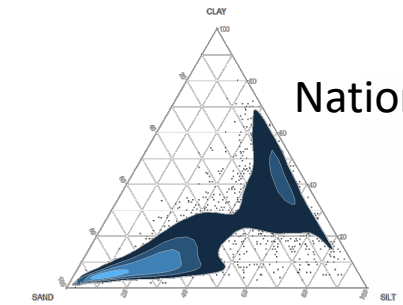
Problem with classification of grasslands

Share of total area by type and land cover (%), 2018

	Total area (km2)	Woodland and shrubland	Cropland	Grassland	Water areas and wetland; bareland	Artificial
EU	4 125 107	46.8	24.2	17.4	7.3	4.2
Finland	338 411	69.6	5.3	5.7	17.6	1.7
Sweden	447 424	68.5	4.0	5.5	20.1	1.8

Source: Eurostat (online data code: lan_lcv_ovw)

eurostat

Fodder crops: 0.9 %

Swedish national statistics (Land Use in Sweden 2020, Statistics Sweden (SCB))

Agricultural land: 7 %
- 6 % cropland
- 1 % grassland (pastures)
- 45 % of the cropland was ley (often grass clover mix), about 2.7 % of the total land use

Ley: temporal grassland (often 1-3 year grass, clover or grass-clover mix) in the crop rotation, on cropland.

Problem with classification of grasslands

It looks like part of the land classified as grassland in LUCAS is ley in a crop rotation on crop land.

Why is that a problem?

- Statistics related to important land use changes becomes unreliable.
  - Grassland to cropland
  - Impact on scenario modelling

- Part of the croplands are not included in the cropland statistics
  - Biased – excluding soils that benefits from having ley in the rotation
    and often organic fertiliser inputs
    potentially with god soil health
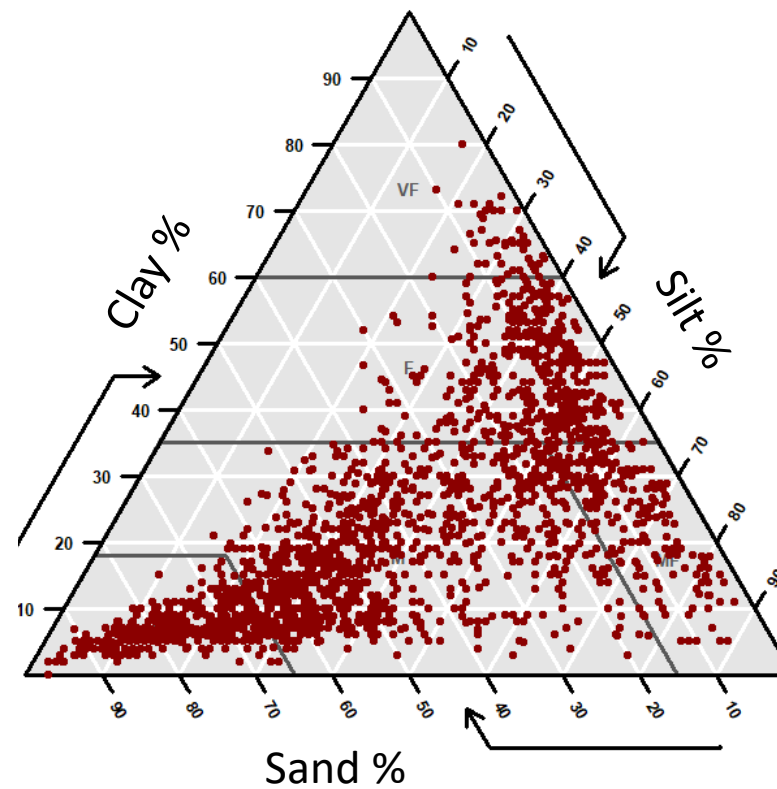
- Difficult to compare European
  and national statistics

Some soil properties

Soil texture

LUCAS (2015)
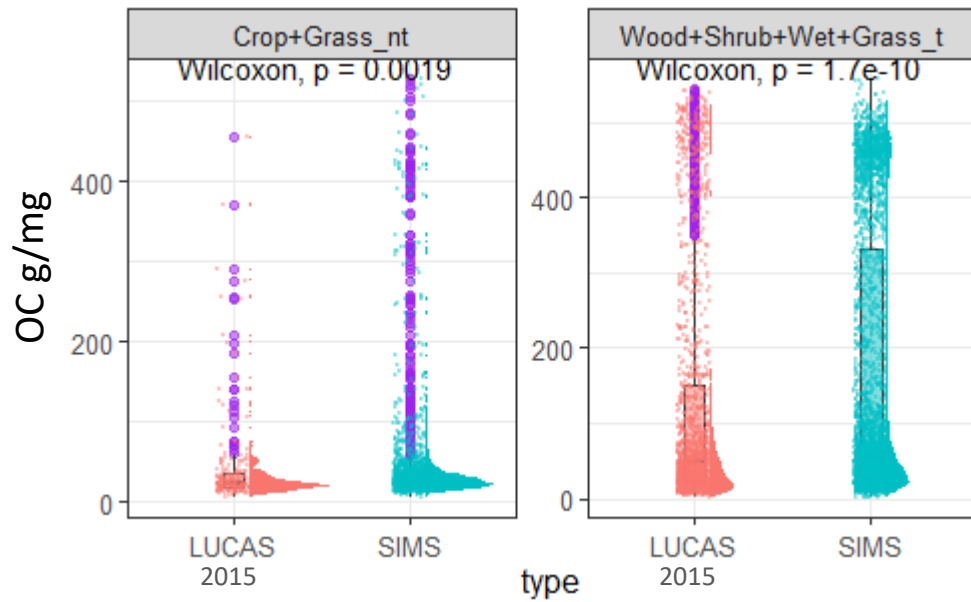(cropland + grassland without trees)
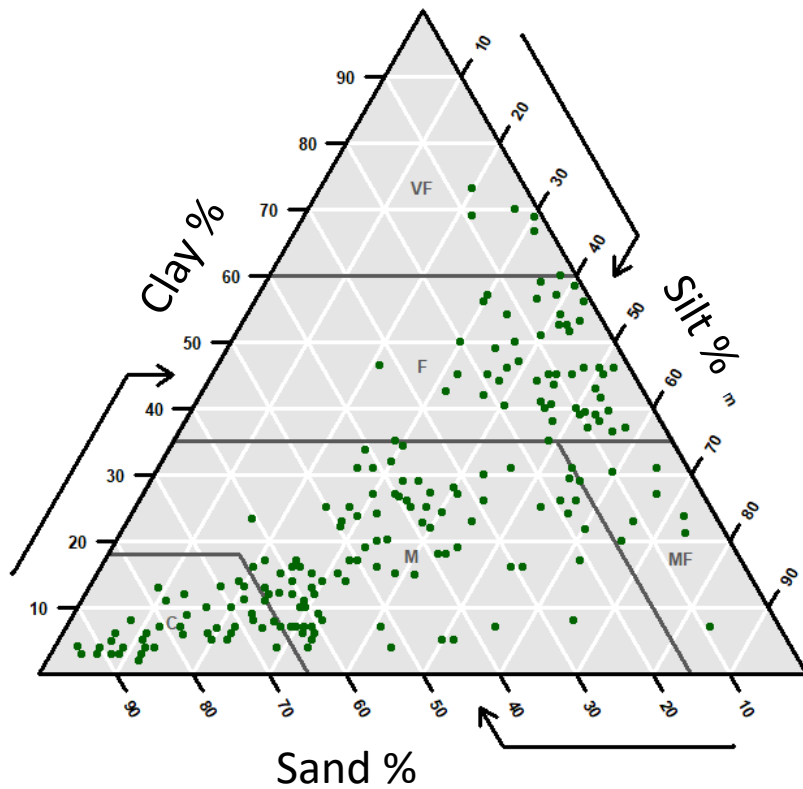
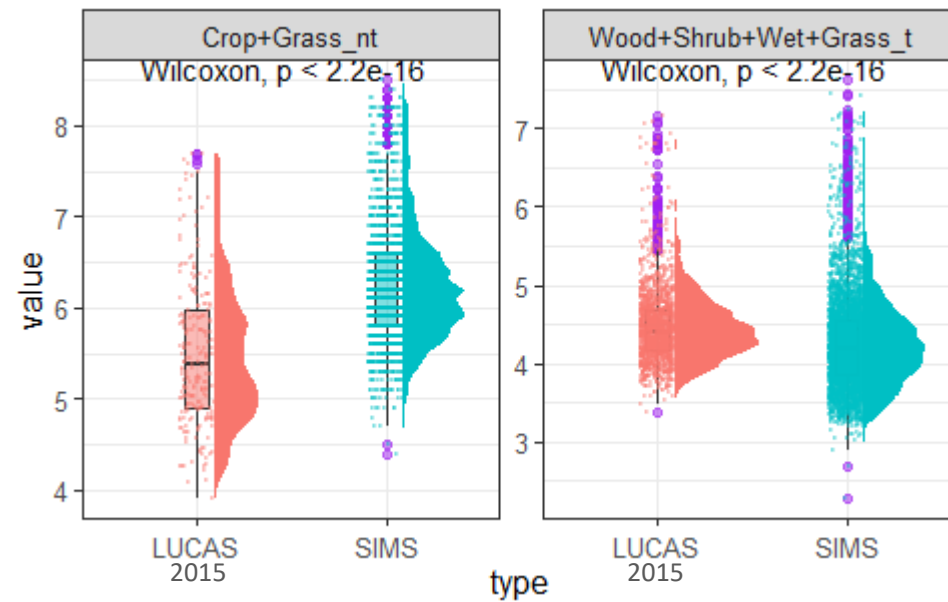Swedish Soil and crop monitoring programme
(cropland)

Some soil properties

Organic carbon

pH

Challenges for harmonisation

Main issue is to be able to continue to use the existing inventories and time series, while at the same time provide good data for the European scale.

- Soil depth
  - LUCAS (since 2022, 0-30) - Soils and crop inventory (0-20), Forest Soil inventory (several depth)
- Sampling protocol
  - Especially for the forest soils
- Different analyses methods
  - e.g. plant available nutrients
  - Also want be relevant for national agriculture advise

Important not to loos the national relevance to be able to fit into a European framework.

Possibilities for the national soil monitoring

Increased interest and visibility of the national inventories!

Possibilities to include new analyses that are not part of the current inventories.
- e.g. Bulk density in agricultural soils?
- e.g. P-Olsen in parallel with P-AL?

Develop new inventories for better national information on soil erosion and water related properties?