



# Assessing soil characteristics over time: the LUCAS –SOIL approach?

**ESBN Plenary Hungary**

**Arwyn Jones**  
**SOIL Action**

The protection of soil and the preservation of soil functions:

- (a) food and other biomass production, including in agriculture and forestry;
- (b) storing, filtering and transforming nutrients, substances and water, as well as replenishing bodies of groundwater;
- (c) basis for life and biodiversity, such as habitats, species and genes;
- (d) physical and cultural environment for humans and human activities;
- (e) source of raw materials;
- (f) acting as carbon reservoir;
- (g) archive of geological, geomorphological and archaeological heritage.



**Sealing**



**Erosion**



**Organic matter decline**



**Compaction**



**Salinisation + Acidification**



**Contamination**

**Landslides**





Simple question will  
be asked to EC / JRC  
/ MS

Soil protection / n  
Emissio

Is legislation resulting  
in increasing soil  
functions while threats  
are decreasing?

ns,

sed erosion

**DPSI**

Food security



# How to assess changes in soil properties?

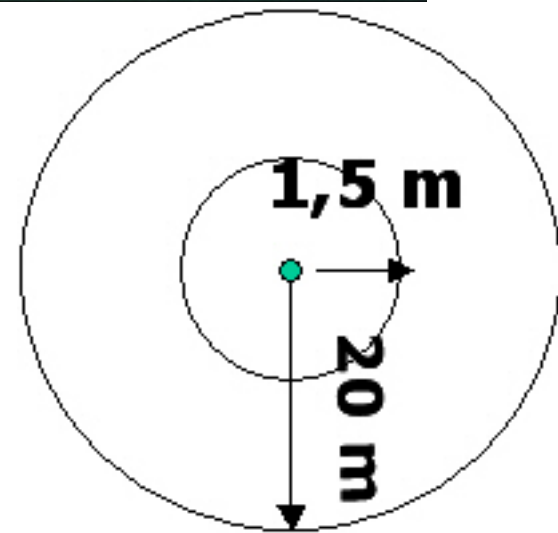
One approach: LUCAS SOIL.

Funded by EUROSTAT, part of the European Statistical Working Programme.

An area frame survey.

Regular 1 km INSPIRE-based grid over all EU (around 4 million points), every other point selected.

Stratification through land cover label to each point.





**Legend**

- Arable Land
- Permanent Crops
- Grassland
- Woodland, Shrubland
- Bare Land
- Artificial Areas
- Water



Subset of points (250,000) is physically surveyed.

LUCAS 2009: soil sampled on 10% of survey sites

Topsoil composite sample collected from 23,000 locations (0.5 – 1/0 kg) = 13 tonnes!

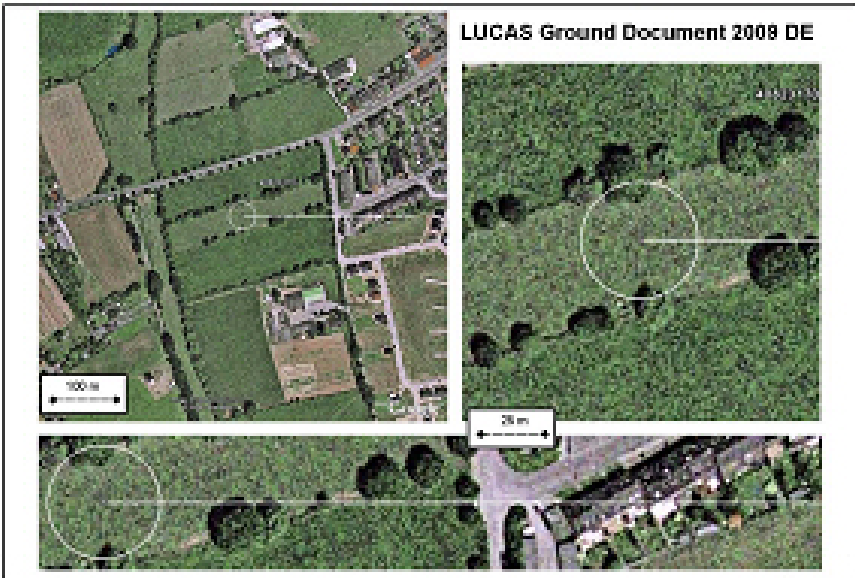
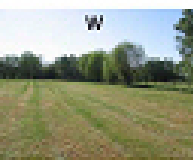
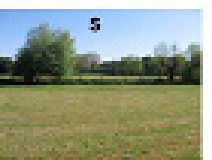
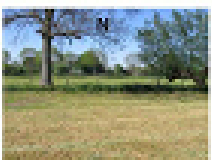
Analysis of chemical and physical parameters in single laboratory.

Survey results combined with the results of the stratification to calculating area estimates for land cover and land use classes all over Europe.





**Point ID: 40823170**  
**Latitude: 51.589717**  
**Longitude: 4.649941**  
 Projection: WGS84  
 Observation: 2008-03-07  
 Distance: 1 m to the S  
 Date: 03/05/2007  
 Direction: on the point  
 LC1: 602 LC2: -8  
 LU1: U111 LU2: -8



Source: Google Earth Professional / Projection: MGS 84, Lat/Long, Year: N/A





## Some issues?

Huge amount of samples and independent dataset.

**However:**

AREA-FRAME = land cover not soil 'bodies'.

Point-based – one value per x km.

Topsoil only.

Not carried out by soil experts.

Precise location data confidential due to exact geographical coordinates = aggregation of results.



# ALTERNATIVES.....?

