

**LUCAS 2012**  
**(Land Use/Cover Area frame**  
**statistical Survey)**

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**GEODIS<sup>o</sup>**





# 1.1 What is LUCAS

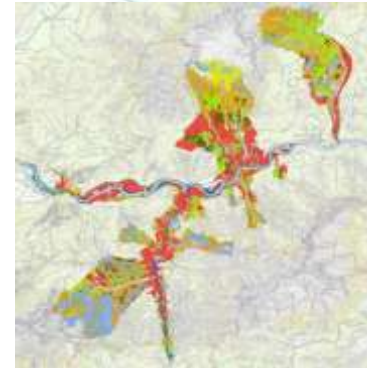
- *a multi-purpose land use/cover survey carried by EUROSTAT*
- *focus on state, dynamics and changes*
- *allow us obtain harmonized estimates at the level of all 27 EU countries*
- *examples of data use:*
  - *nature protection*
  - *forest and water management*
  - *urban and transport planning*
  - *agricultural policy*
  - *natural hazards prevention and mitigation*
  - *soil protection and mapping*
  - *monitoring climate change*
  - *biodiversity, etc.*




## 1.2 Statistical survey X Mapping

### *Mapping*

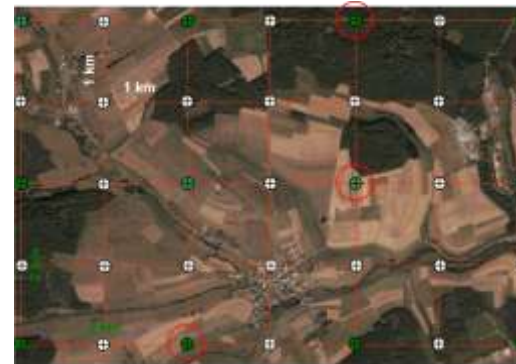
-  *spatially exhaustive (European CORINE Land Cover project, National biotope mapping, Regional land use mapping)*
-  *expensive*



### *Statistical survey*

-  *Cheaper than mapping approaches*  
*Time consistent: data collection within a short period of time*  
*Fast: final data (quality controlled) available within a short time after collection*

*Output: tables, not maps*



## 2.1. Sampling design of LUCAS points

*LUCAS is based on a sound statistical framework*

*Sampling method: 2-phase stratified area frame sampling of points covering entire EU territory*

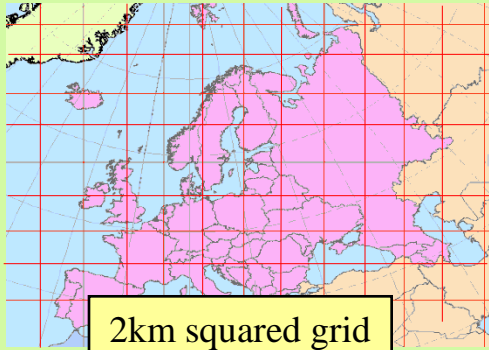
*Aims:*

- *obtaining a reasonable balance among the strata (the agricultural strata were over-represented in the previous rounds of the survey) since the focus of the survey changed from a merely agricultural to a broadly agro-environmental one;*
- *providing reliable estimates at a geographical level more detailed than the EU one for the most relevant land cover classes in the various countries;*
- *gathering longitudinal data on land cover and land use to monitor their changes (for the countries involved in the 2006 round).*

*Harmonised nomenclature: applicable in all EU MS*

*Harmonised data collection method: in all countries (Field Survey according to well defined instructions)*

## First phase sample for stratification: orthophoto interpretation



2km squared grid



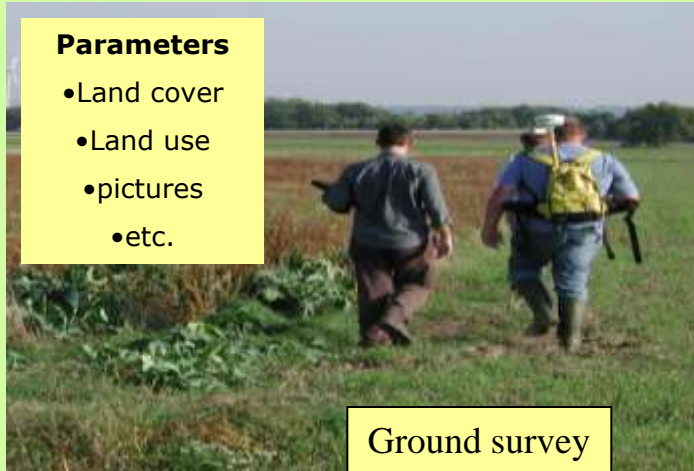
1 100 000 points

- LAND COVER classes**
- 1 ARABLE LAND
  - 2 PERMANENT CROPS
  - 3 GRASSLAND
  - 4 WOODED AREAS AND SHRUBLAND
  - 5 BARE LAND, RARE VEGET.
  - 6 ARTIFICIAL LAND
  - 7 WATER

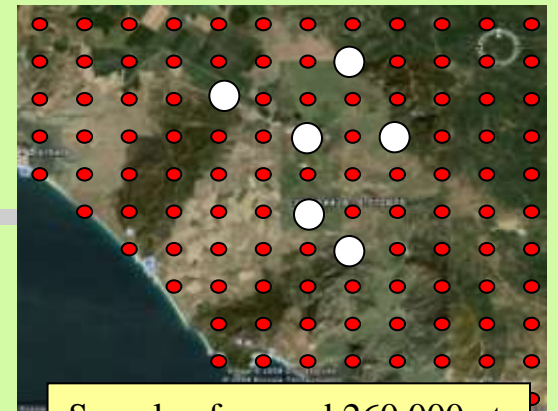
## Second phase sample: in-situ data collection

### Parameters

- Land cover
- Land use
- pictures
- etc.

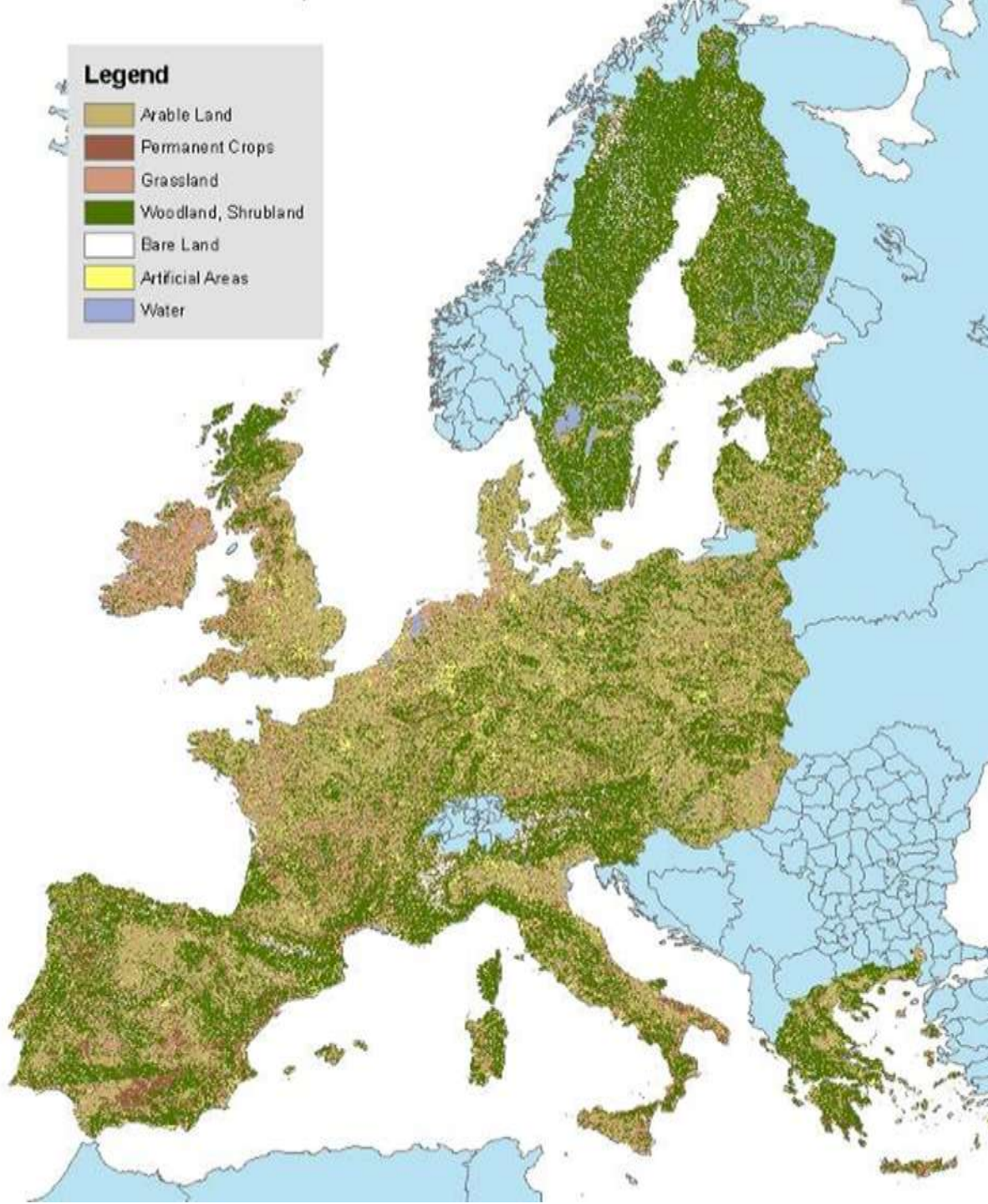


Ground survey



Sample of around 260,000 pts.





**Stratification result:**

*Photo- interpretation of 1 Mio LUCAS Points*

- *arable land*
- *permanent crops*
- *grassland*
- *wood/shrub land*
- *bare land, low/rare vegetation*
- *artificial land*
- *water*



## 2.2 The statistical unit

*The Observation Point*



*The "Extended Observation Window"*





# 3.1. Development of LUCAS (2001-2012)

## LUCAS 2001

- 13 member states EU

## LUCAS 2002

- UK, IE, EE, HU, SI

## LUCAS 2003

- 15 member states EU and HU

## LUCAS 2005

- LT, LV, PL

## LUCAS 2006:

- 11 member states EU (BE, CZ, DE, ES, FR, HU, IT, LU, NL, PL, SK)

## LUCAS 2007:

- 13 member states EU (BE, CZ, DE, ES, FR, HU, IT, LT,LU, LV, NL, PL, SK)

## LUCAS 2008:

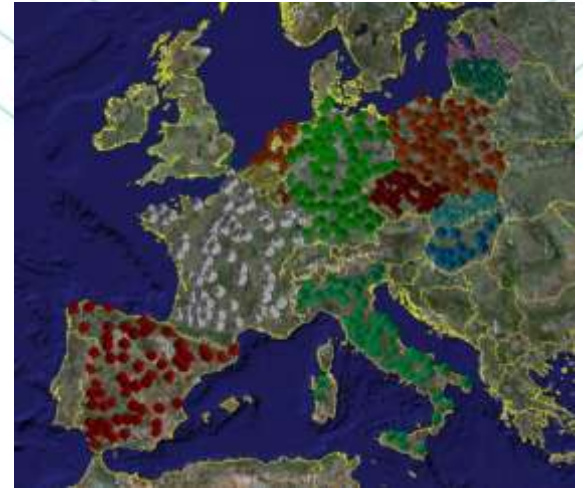
- BG, RO

## LUCAS 2009:

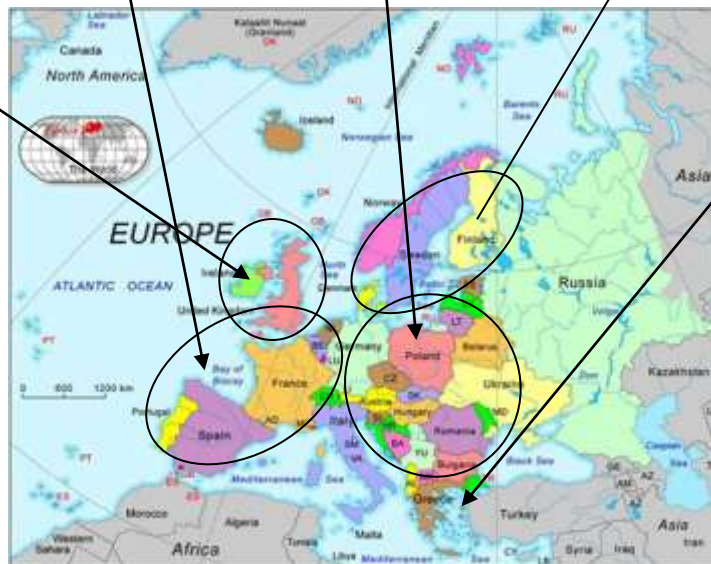
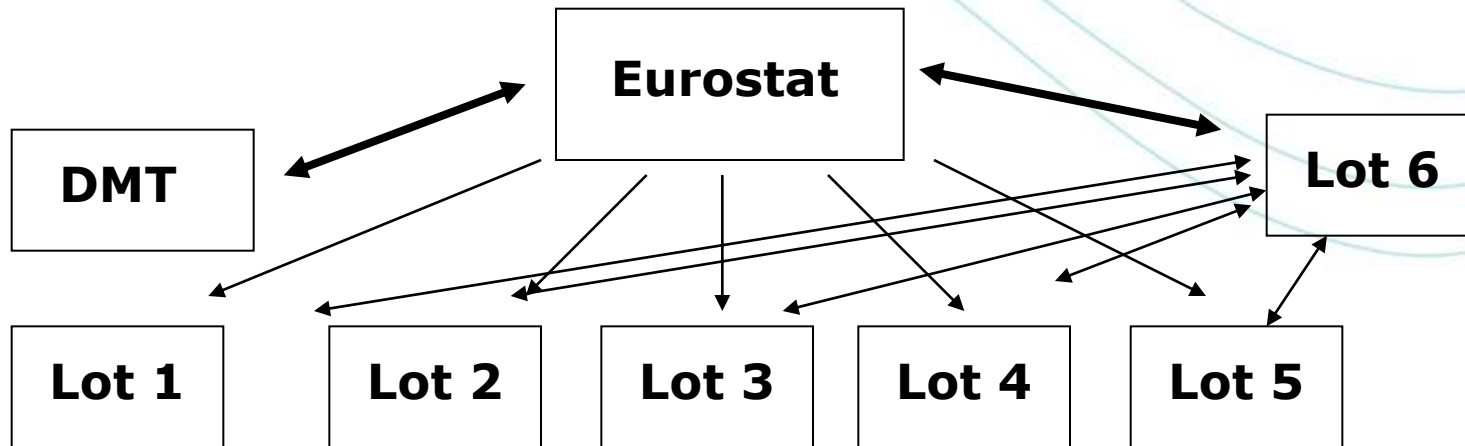
- 23 member states EU (AT, BE, CZ, DE, DK, EE, ES, FI, FR, GR, HU, IE, IT, LT, LU, LV, NL, PL, PT, SE, SK, SI, UK)

## LUCAS 2012:

- all 27 countries EU



## 3.2. Organisation of LUCAS 2012



## 3.3. Point sample of LUCAS 2012

Country	2012	2009	2012_2009	Country	2012	2009	2012_2009
AT	6474	4966	1508	IT	21019	17853	3166
BE	2448	1809	639	LT	3889	3862	27
BG	6643		6643	LU	215	152	63
CY	1442		1442	LV	4421	3826	595
CZ	5515	4673	842	MT	79		79
DE	24941	21138	3803	NL	2241	2453	-212
DK	3445	2557	888	PL	21806	18504	3302
EE	2202	2675	-473	PT	7338	5428	1910
ES	35378	29913	5465	RO	14281		14281
FI	13483	19896	-6413	SE	22431	26662	-4231
FR	38343	32329	6014	SI	1618	1201	417
GR	7891	7789	102	SK	2452	2895	-443
HU	4640	5516	-876	UK	12265	14448	-2183
IE	3489	4164	-675	Total	270389	234709	35680





# Parameters:

- Land cover (1 & 2)
- Land use (1 & 2)
- Land Cover percentage
- Area size
- Height of trees
- Width of features
- Transect (250 m to east) with linear features
- Land management (grazing)
- Water management

LUCAS 2012 - LAND USE / COVER AREA FRAME STATISTICAL SURVEY

**OBSERVATION**

Observer ID	DATE	TIME	END DATE
1	1	1	1

**Observed:**  
 1 | The point is obscured  
 2 | Point is not visible  
 3 | Measure size  
 4 | Out of subject terrain

**Type of observation:**  
 1 | Field survey, point-visible, 0-100m to pt  
 2 | Field survey, point-visible, >100m to pt  
 3 | Photo-interpretation, point-visible  
 4 | The point is not observed

**SPS possible species:**  
 1 | No SPS  
 2 | Problem with signal

**Latitude:** 10.000000  
**Longitude:** 1.000000

**Coordinates:** UTM  
 Easting: 1000000  
 Northing: 1000000

**Observation:**  
 1 | Lat the point  
 2 | Lat  
 3 | Lon  
 4 | Lon

**Description of the way to the point:**  
 Remarks about special circumstances very important for the point, avoid double use (max. 500)

**Land cover and land use**

L1	L2	L3	L4
1	1	1	1

**LU CODES:**  
 011 Agriculture  
 012 Pasture  
 013 Forest  
 014 Other forest  
 015 Water  
 016 Urban  
 017 Other built-up  
 018 Bare soil  
 019 Snow/ice  
 020 Other

LUCAS 2012 - Land Use / Cover Area Frame Statistical Survey

**Water management ONLY in LU = UTM of UTM**

Presence of water management (MGT)	1   Irrigation 2   Fertiliser application 3   Drainage 4   Irrigation and drainage 5   No visible water management 6   N/A	Source of irrigation:	1   Shad 2   Canal/Lake/Reservoir 3   Stream/Canal/Drain 4   Groundwater 5   Other/not identifiable 6   N/A
Type of irrigation:	1   Gravity 2   Pressure/Sprinkler irrigation 3   Pressure/Surface irrigation 4   Gravity/Pressure 5   Other/not identifiable 6   N/A	Delivery System:	1   Canal 2   Shad 3   Pipeline 4   Other/not identifiable 5   N/A

**Transect**

Transect 01	02	03	04	05	06	07	08	09	10	11	12
01	02	03	04	05	06	07	08	09	10	11	12

**Remarks about the transect:** (log system for generality and of transect progression; 00=continuous)

**REMEMBER TO TAKE A TRANSECT PHOTO AND MARK THE END TIME OF OBSERVATION**

**Photos**

Photo 01	Photo 02	Photo 03	Photo 04
01	02	03	04



# Photodocumentation of lanscape

## Crop



## Water mng.



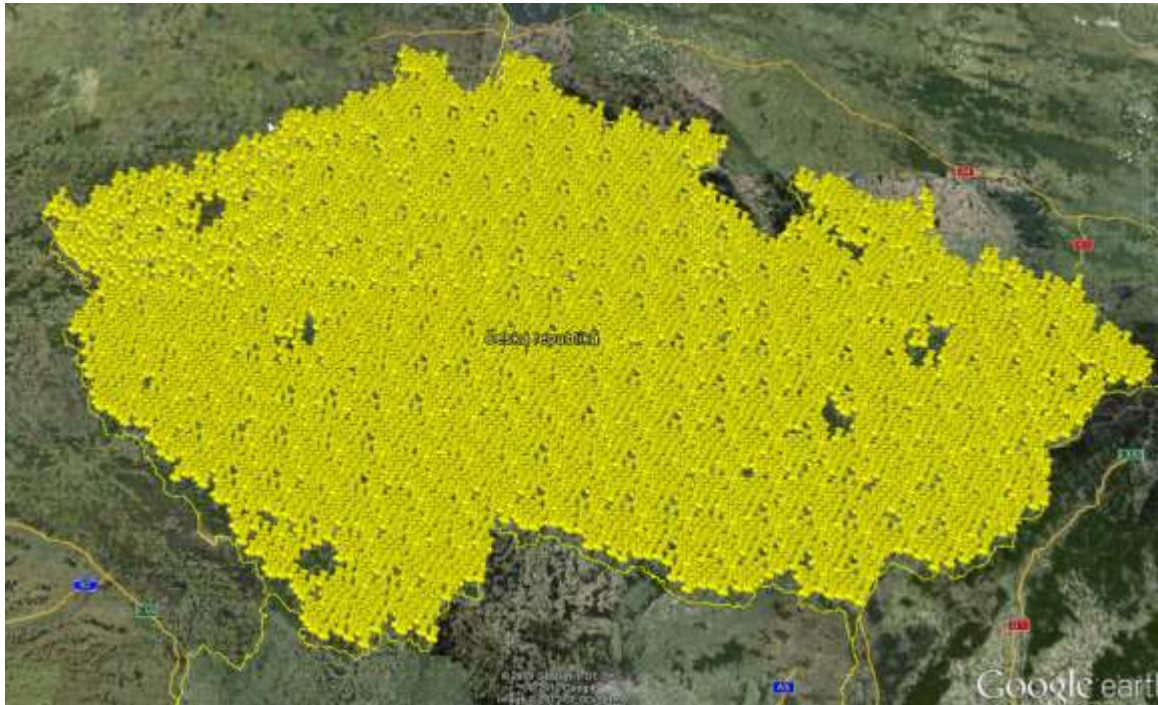
## Transect





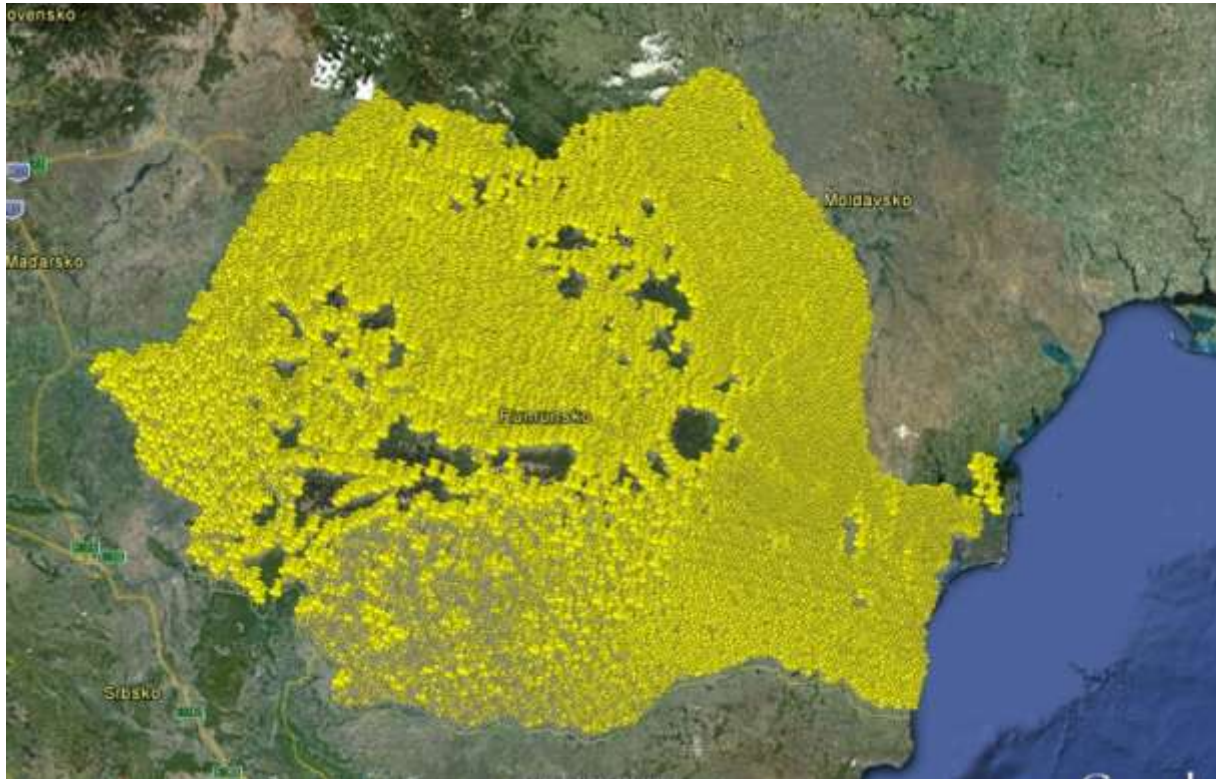
## 4.2. LUCAS CZ

- *LUCAS 2012 - 11 surveyors*
- *2 QA + project management*
- *5515 points*
- *57 days in field*
- *110 000 km cover distance*



## 4.3. LUCAS ROMANIA

- *14280 points*
- *LUCAS 2012 - 30 surveyors*
- *2 -6 QA + project management*
- *60 days in field*



## 5.1. LUCAS USAGE

- *The visibility of LUCAS results and primary data has increased exponentially the use of the data*
- *The customer DGs use the LUCAS data for many purposes*
  - *In situ data for GMES: many products will have 2012 as reference year (Corine, urban atlas, high resolution data layers etc.)*
  - *Biodiversity issues*
  - *High nature value farmland*





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**Thank you.**

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