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Readme file for the LUCAS 2015 Topsoil datasets

This package contains the LUCAS Topsoil data of the 2015 LUCAS soil survey. It contains a CSV and Excel file with soil data, and an ESRI shapefile that shows the LUCAS Master Grid sampling points and an associated attribute table that holds the soil data.

[*LUCAS_Topsoil_2015_20200323.xlsx*](#): this Excel file includes the analytical data of samples that passed the data evaluation. The file contains the identification code “Point_ID” of the samples and data of physical and chemical properties for each sample.

A detailed description of the evaluation of the data in this file is documented in the report:

Jones, A, Fernandez-Ugalde, O., Scarpa, S. LUCAS 2015 Topsoil Survey. Presentation of dataset and results, EUR 30332 EN, Publications Office of the European Union: Luxembourg. 2020, ISBN 978-92-76-21080-1, doi:10.2760/616084, JRC121325

Note that there are 21,859 points, of which 4,246 are at new locations when compared with the 2009/2012 campaigns.

Description of the fields in the [*LUCAS_Topsoil_2015_20200323.xlsx*](#) excel file:

Field	Description	Units/ Values	Limit of detection/ Measurement range
Point_ID	Unique identifier of the LUCAS survey point	8 digits number	–
Revisited_point	Is the point visited in both 2009/2012 and 2015 surveys	Yes / No	–
Coarse	Coarse elements	%	> 2000 µm
Clay	Clay content	%	0.02 – 2000 µm
Silt	Silt content	%	0.02 – 2000 µm
Sand	Sand content	%	0.02 – 2000 µm
pH(CaCl ₂)	pH measured in a CaCl ₂ solution	–	2 – 10
pH(H ₂ O)	pH measured in a suspension of soil in water	–	2 – 10
EC	Electrical conductivity	mS/m	0.1
OC	Organic carbon content	g/kg	2
CaCO ₃	Carbonates content	g/kg	1
P	Phosphorus content	mg/kg	10
N	Total nitrogen content	g/kg	0.2
K	Extractable potassium content	mg/kg	10

Please note that for carbonates, values below the limit of detection (including the zero value) indicate that the content of carbonates in the sample is negligible. In the case of P, contents below 10 mg/kg (the limit of detection) could not be quantified with enough uncertainty in the

samples by the laboratory. It is up to each user to decide which samples should be omitted from their studies because their P contents were well below the limit of detection.

For the revisited points, one can link the data of the LUCAS 2015 and 2009/2012 soil surveys using the Point_ID of the samples. The LUCAS Topsoil dataset of 2009/2012 surveys can be accessed from the website of ESDAC: <https://esdac.jrc.ec.europa.eu/>

Detailed information on land cover and land use, irrigation management, structural elements in the landscape and crop residues for the LUCAS 2015 campaign can be accessed from the website of Eurostat: <https://ec.europa.eu/eurostat/web/lucas/data/primary-data/2015>.

In order to find the connection between the LUCAS 2015 topsoil data and general LUCAS 2015 campaign data, you need to use the Point_ID values.

For the convenience of the user, we added in the Excel file a number of fields (Elevation, LC1, LU1, SOIL_STONES, NUTS_0, NUTS_1, NUTS_2) that may be useful. The field values were taken from the official Eurostat LUCAS 2015 campaign microdata.

Elevation	The elevation at which the soil sample was taken (in meter) (GPS_ALTITUDE)
LC1	LandCover class
LU1	LandUse class
SOIL_STONES	Percentage of Stones in the sample, as a class
NUTS_0	NUTS code for the country where the sample was taken
NUTS_1, NUTS_2, NUTS_3	NUTS 1, 2 and 3 codes for the location where the sample was taken
LC1_Desc	LandCover class description
LU1_Desc	LandUse class description

The possible class values for LC1, LU1, SOIL_STONES and descriptions can be found on the Eurostat page; see link [LUCAS 2015 Record Descriptor](#).

LUCAS_Topsoil_2015_20200323.shp

This point shapefile has been derived using the *theoretical coordinates* for the soil sampling points; these coordinates are explicitly part of the Eurostat LUCAS 2015 campaign microdata. The attribute table of the shapefile contains the following attributes: Point_ID, Coarse, Clay, Sand, Silt, pH_CaCl2, pH_H2O, EC, OC, CaCO3, P, N, K, LC, LU, NUTS_0, NUTS_1, NUTS_2, NUTS_3, LC0_Desc, LC1_Desc, LU1_Desc

LC corresponds to the LC1 field of the Excel file; LU corresponds to the LU1 field of the Excel file; LC0_Desc is a description of the main group of Land Cover with following possible classes:

- (A00) artificial land
- (B00) cropland

(C00) woodland
(D00) shrubland
(E00) grassland
(F00) bare land
(G00) water
(H00) wetland

Note that this field is not actually part of the Eurostat microdata.