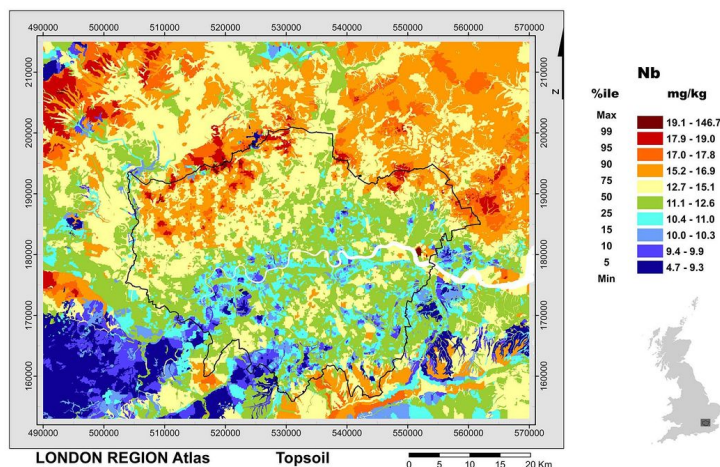


Niobium: LRA

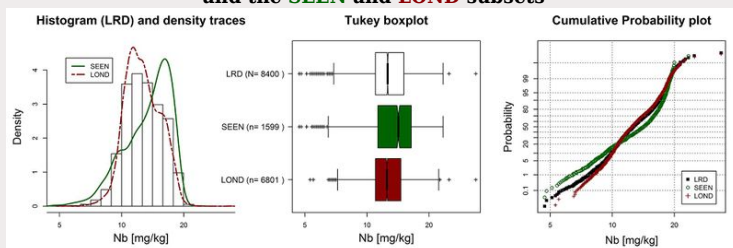
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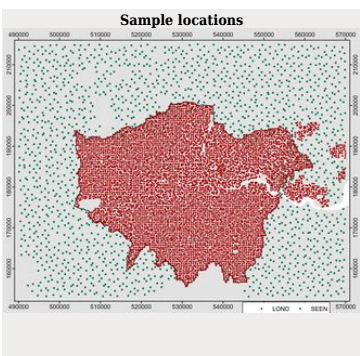


The black outline represents geographical limit of the Greater London Authority (GLA). Areas in white represent tidal waters of the River Thames. The London Region Atlas (LRA) covers a rectangular area of 80 x 62 km, from British National Grid coordinates: Easting 490 000 and Northing 153 000 to 215 000. The LRA was produced using the London Region Dataset (LRD, n=8400), created from two geochemical surveys (LOND and SEEN) carried out by the Geochemical Baseline Survey of the Environment (G-BASE) project during 2008 and 2009 for LOND, and from 2005 to 2009 for SEEN. The LOND survey is an urban soil geochemical survey based on 6801 sampling sites, 93% of which are located within the GLA, at a sampling density of 1 per 0.25 km². SEEN is a south-east England rural soil survey done at a sampling density of 1 per 2 km². A total of 1599 of the SEEN samples are included in the LRA area. As these are rural samples, 95% of them are outwith the GLA limit.

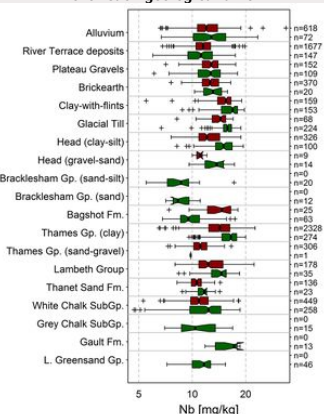
Summary statistics for the LONDON REGION topsoil dataset (LRD) and the SEEN and LOND subsets



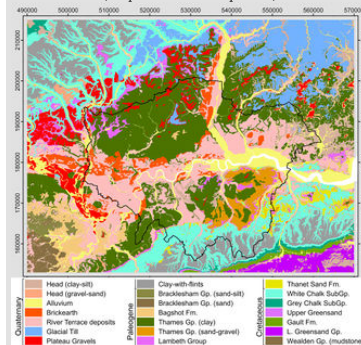
Nb [mg/kg]	statistical parameters		
	LRD	SEEN	LOND
N	8400	1599	6801
%<LLD (1)	0	0	0
minimum	4.7	4.7	5.3
Q25	11	11.3	11
median	12.6	14.2	12.5
Q75	15.1	16.4	14.6
Q95	17.8	18.3	17.5
Q99	19	19.1	18.8
maximum	146.7	23.4	146.7
MAD	2.8	3.7	2.5
CVR%	22.4	26.1	20.2
mean	13.1	13.8	12.9
SD	3.1	3.2	3
CV%	23.5	23.3	23.4
GM	12.8	13.3	12.6
GSD	1.23	1.29	1.22
powern	1.49	0.7	1.44
skewness	10.08	-0.35	13.25



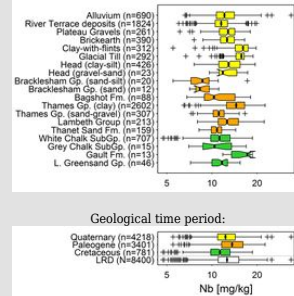
LOND and SEEN topsoil concentrations over each geological unit



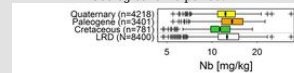
Simplified GEOLOGY (adapted from DiGMapGB-50)



LRD topsoil concentrations over each geological unit:

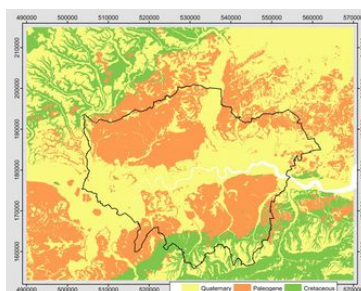


Geological time period:



At each site a composite topsoil (5–20 cm depth) sample comprising five subsamples was collected from the corners and centre of a 20 x 20 m square. After collection samples were air/oven dried and sieved to <2 mm before analysis to determine the total contents of more than 50 chemical elements by X-ray fluorescence spectrometry (XRFs).

Each geochemical map was prepared by interpolating the point data using the *parent material mapping method* (Appleton et al., 2013⁴⁴). The LRA area was subdivided into 200 x 200 m squares and intercepted with the geology (parent material) polygons, thereby creating the basic 200 m-PM polygons. For each 200 m-PM polygon the average concentration based on the four nearest samples over the same PM was computed (see further explanation in [Materials and methods](#) and references therein). As the maps (produced in ArcGIS 10.1) show estimated concentrations, there is a degree of uncertainty due to variability in soil composition. The element concentration colour ramp is based on percentile classes of the LRD dataset distribution. The tables and graphs were generated running R (R x 64.3.1.0) in RStudio (Version 0.98.977). The LRD, LOND and SEEN surveys are represented by the colours black/white, dark green and dark red respectively. Quaternary, Palaeogene and Cretaceous geological time periods are represented by soft yellow, orange and lime green colours respectively. For further information go to [Univariate statistics and graphics](#)



Reference

1. [↑](#) Appleton, J D, Johnson, C C, Ander, E L, and Flight, D M A. 2013. Geogenic signatures detectable in topsoils of urban and rural domains in the London region, UK, using parent material classified data. *Applied Geochemistry*, Vol. 39, 169–180. [DOI](#) [10.1016/j.apgeochem.2013.07.010](https://doi.org/10.1016/j.apgeochem.2013.07.010)

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