



British
Geological Survey

NATURAL ENVIRONMENT RESEARCH COUNCIL



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Bags of sand and dirt:

Exploiting the British Geological Survey's
environmental samples and database

Presented by Dr Chris Johnson

*BGS Head of Science for Environmental
Geoscience Baselines*

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Exploiting Geoscience Collections, 12-13th May 2008
Burlington House, London



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Content

- What are the BGS environmental samples and data
- Comment on the public perception of such sample collections
- Examples of how the collection has been exploited

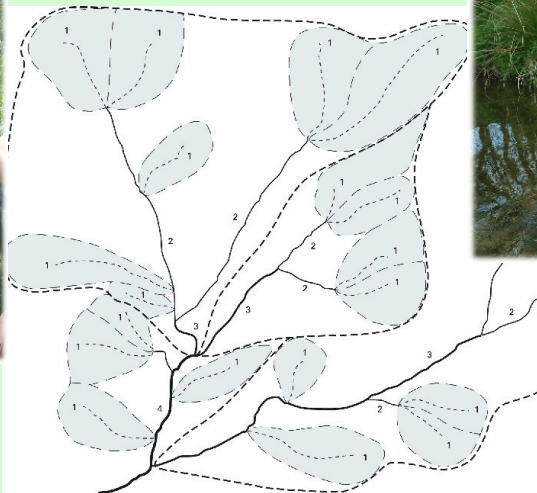
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Environmental Samples?

DRAINAGE SAMPLES



Stream sediment (150µm)

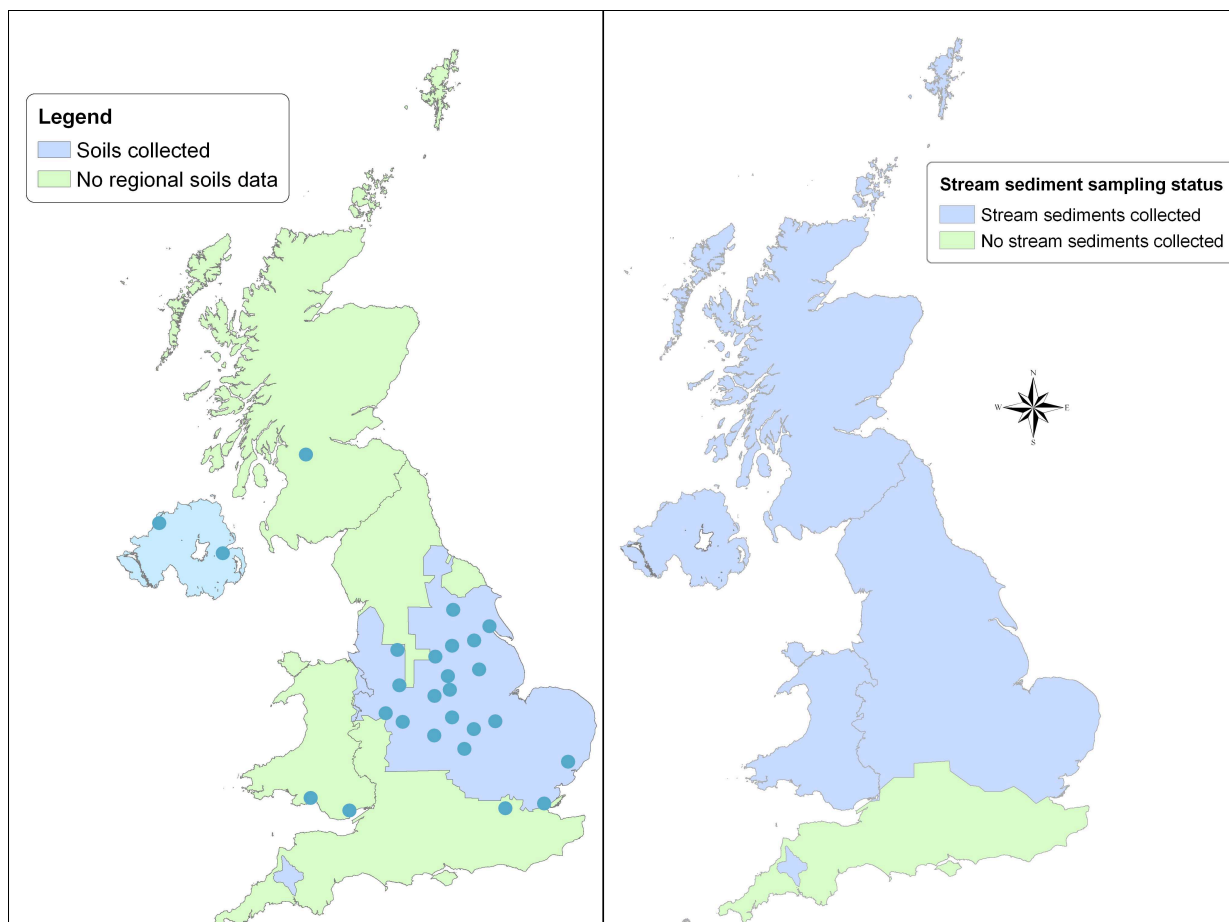


Panned heavy minerals



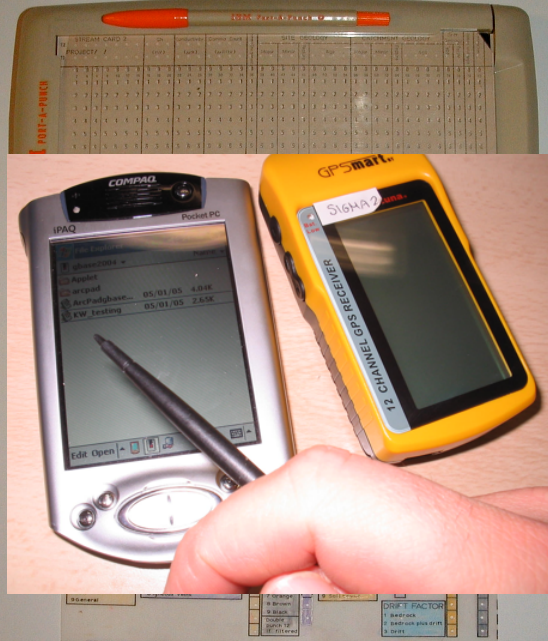
Filtered/unfiltered stream water

Drainage samples are collected from 1st and 2nd order streams and represent small catchment areas



Unique

CARD 1	CODE		SA
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CARD 2	DUPLICATE		
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	36	37	38
CARD 3	SITE LOCATION		
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CARD 4	DBS	MIN	MIN
	B/R	B/R	STY
	1	2	3
CARD 5	FIELD DATA		
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CARD 6	DEPTH		
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CARD 61	DEPTH		
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CARD 62	DEPTH		
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COLLECTORS							
							3
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		67			70		
							3
							7
D	E	F	G	H	I	J	
30	31	32	33	34	35		
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R 2005 Version 2005.1



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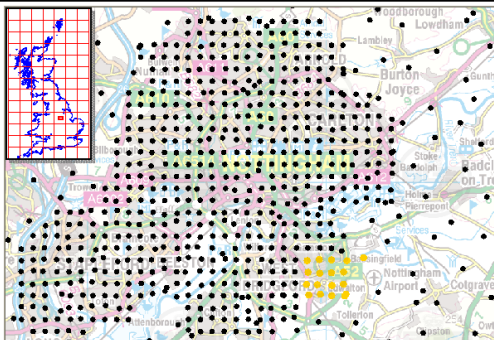
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Change Map Theme Geochemistry

GeoIndex

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GeoIndex Toolbar

Display

Navigate



Query

Printing



Reports



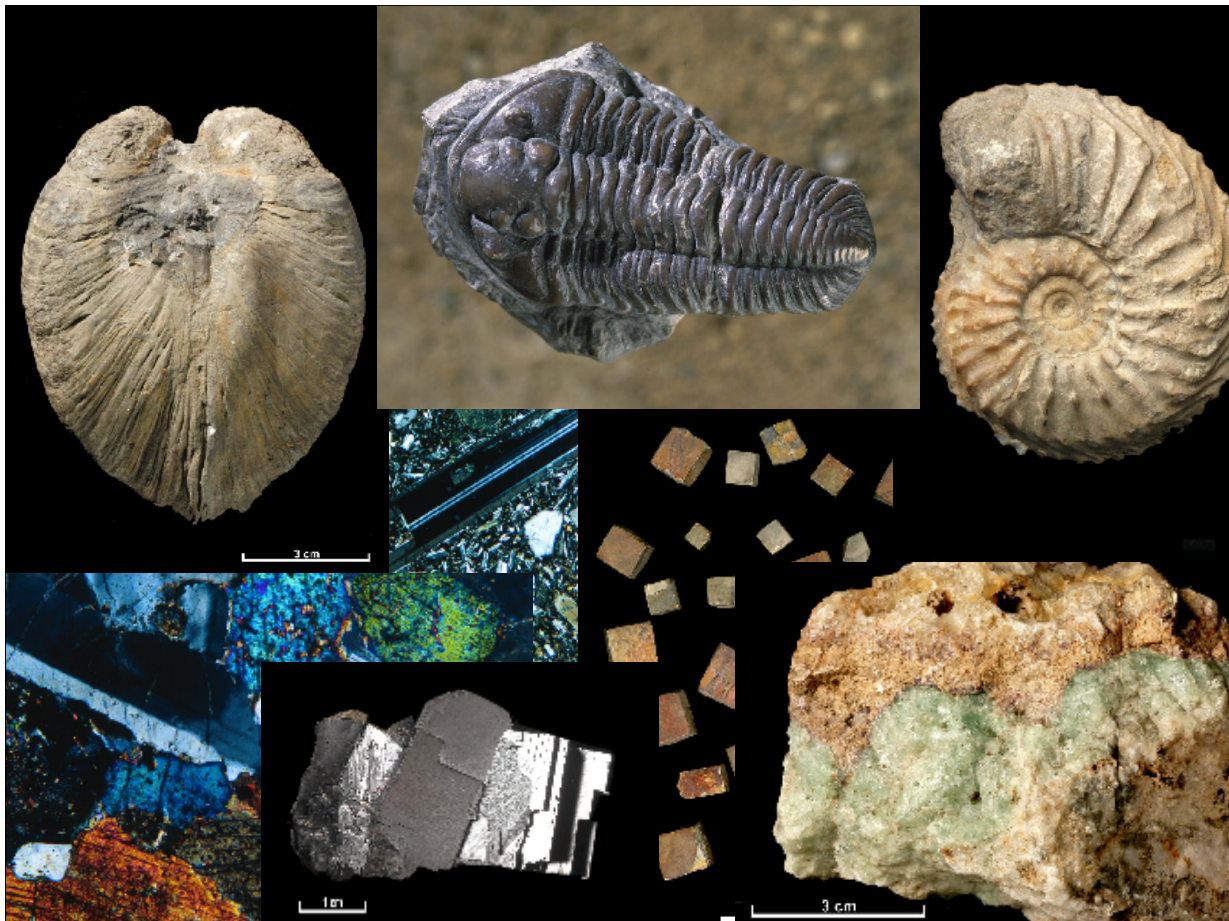
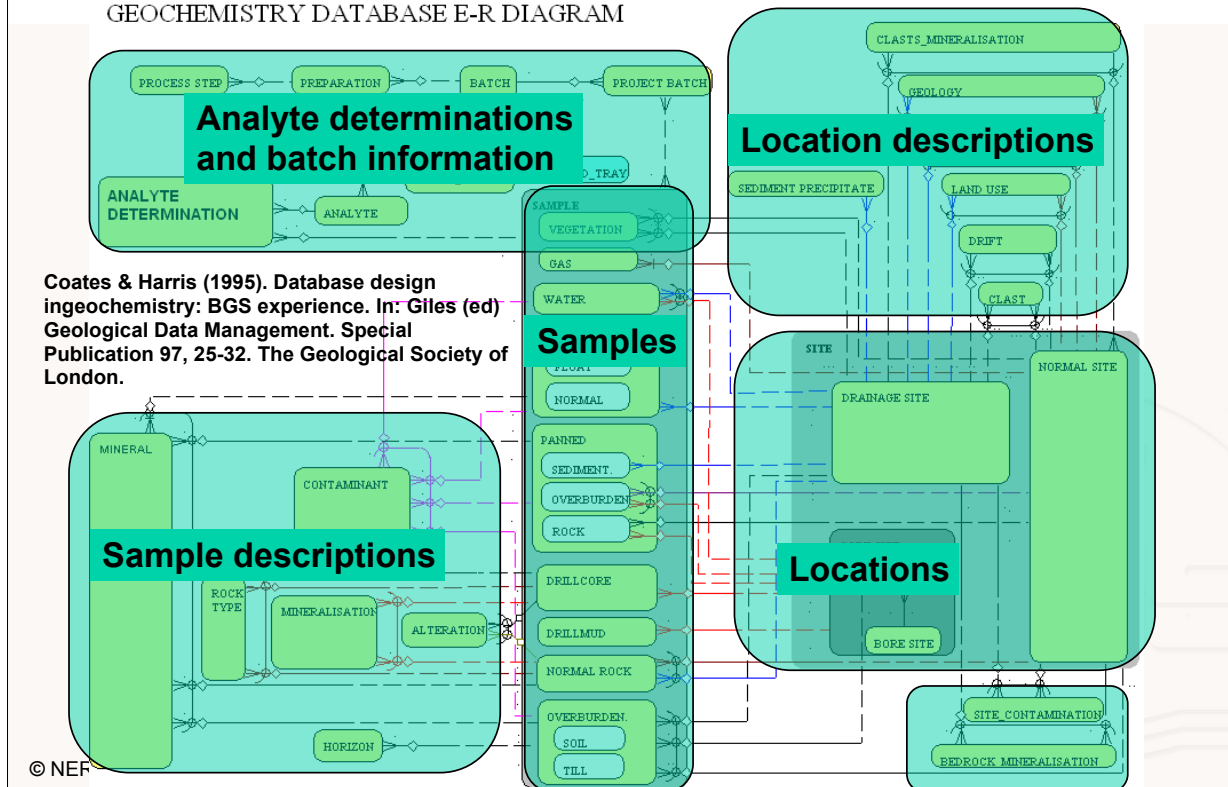
Query/Selection Results - Microsoft Internet Explorer provided by The British Geological Survey						
about:blank						
ZOOM To	SAMPLENO	ANALYTES	EASTING	NORTHING	PROJECT	
1	4 42 849 A +		460850	335310	G-BASE	
2	4 42 2825 A +		461590	336840	G-BASE	
3	4 60 7500 A +	Ag As Ba Bi Ca Cd Ce Co Cr Cu Fe Ga K La Mg Mn Mo Nb Ni P Pb Rb Sb Se Sr Sn Th Ti U V Y Zn Zr	459780	335310	G-BASE	
4	4 60 7408 A +	Ag As Ba Bi Ca Cd Ce Co Cr Cu Fe Ga K La Mg Mn Mo Nb Ni P Pb Rb Sb Se Sr Sn Th Ti U V Y Zn Zr	459297	335277	G-BASE	
5	4 60 7411 A +	Ag As Ba Bi Ca Cd Ce Co Cr Cu Fe Ga K La Mg Mn Mo Nb Ni P Pb Rb Sb Se Sr Sn Th Ti U V Y Zn Zr	460260	335675	G-BASE	
6	4 60 7416 A +	Ag As Ba Bi Ca Cd Ce Co Cr Cu Fe Ga K La Mg Mn Mo Nb Ni P Pb Rb Sb Se Sr Sn Th Ti U V Y Zn Zr	460260	335675	G-BASE	

<http://www.bgs.ac.uk/geoindex/>

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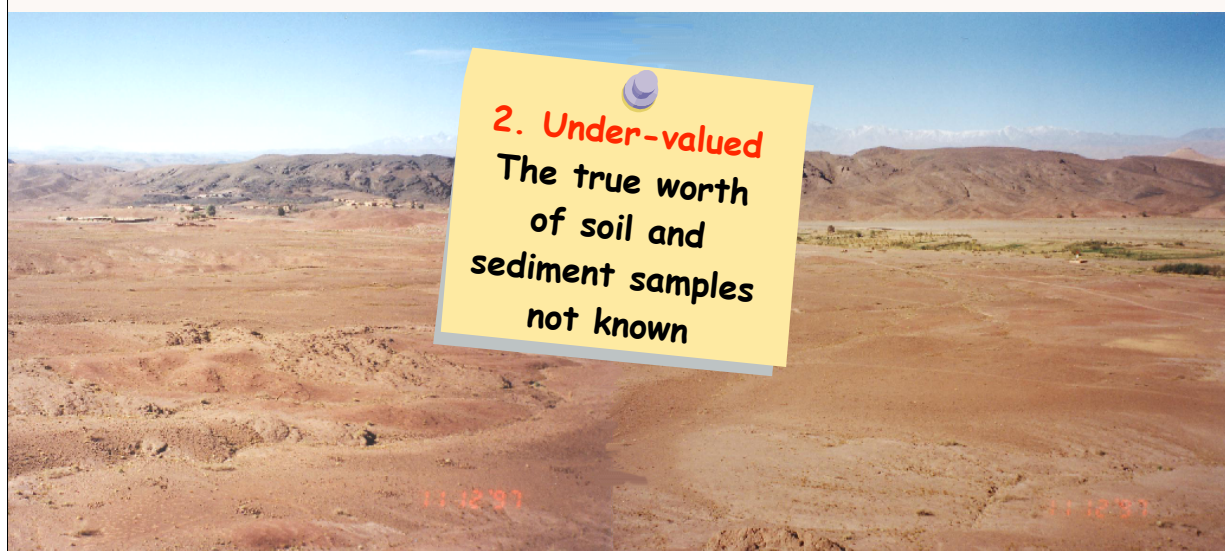
BGS Geochemistry Database

GEOCHEMISTRY DATABASE E-R DIAGRAM





Perceived Value





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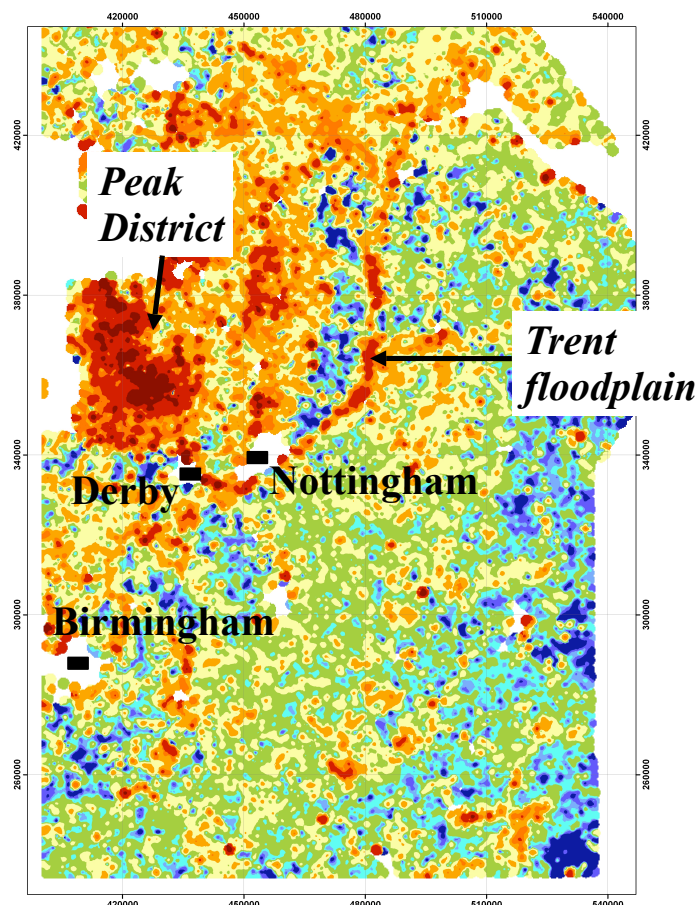
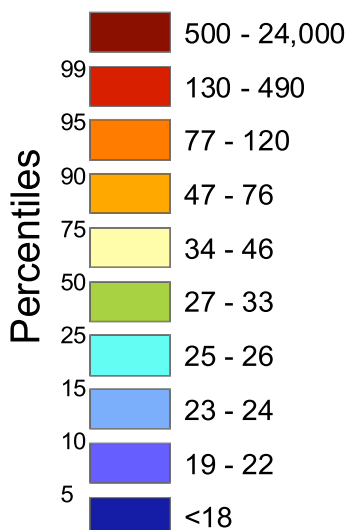
Bre-X scandal

- a gold prospect in Kalimantan, Indonesia
- estimates for the size of the deposit (70m oz) created stock market hysteria. Market capitalisation by 1997 was US\$4.4 billion
- the fraud began to unravel when Bre-X geologist reportedly died falling from a helicopter
- the samples had been “salted” by adding gold dust

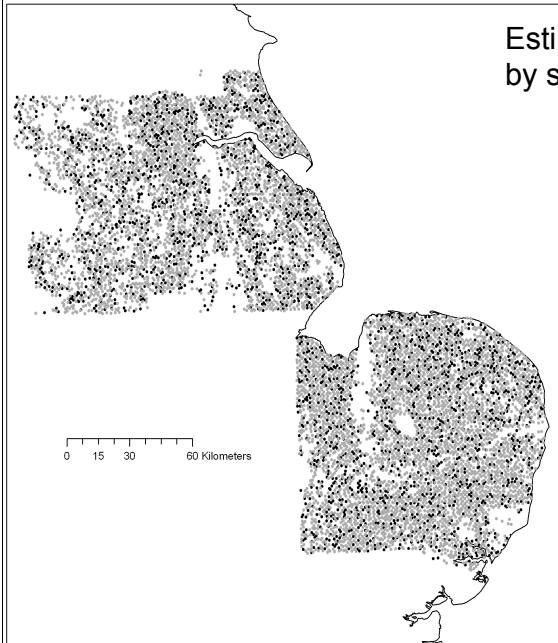
3. Security needed
Many reasons for looking after the security of the samples

Profile (deep) soils

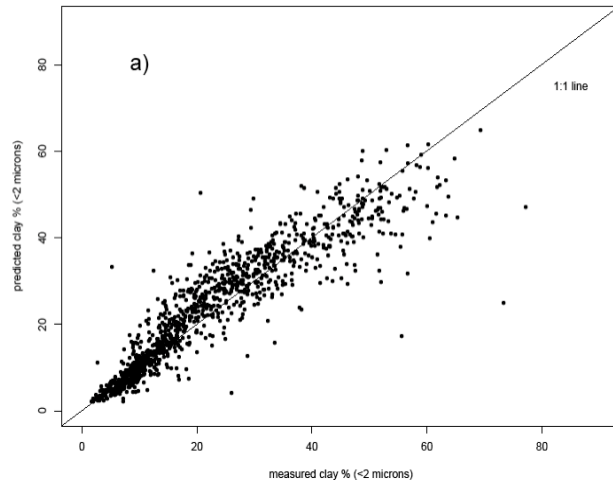
Lead (mg/kg)



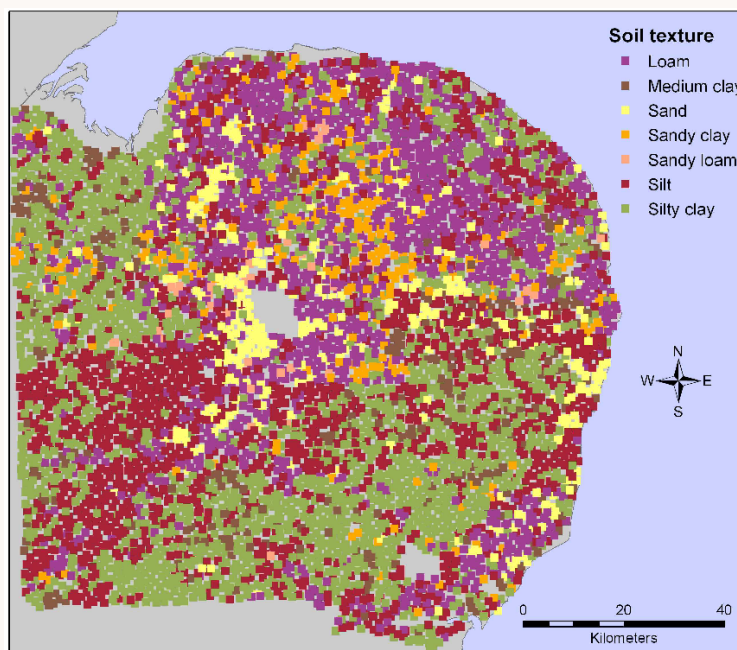
1. Exploiting the samples



Estimating particle-size fractions of soil dominated by silicate minerals from geochemistry



2. Exploiting sample/site information





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Ro L Qualitative assessment of potential leaching from soils of inorganic contaminants

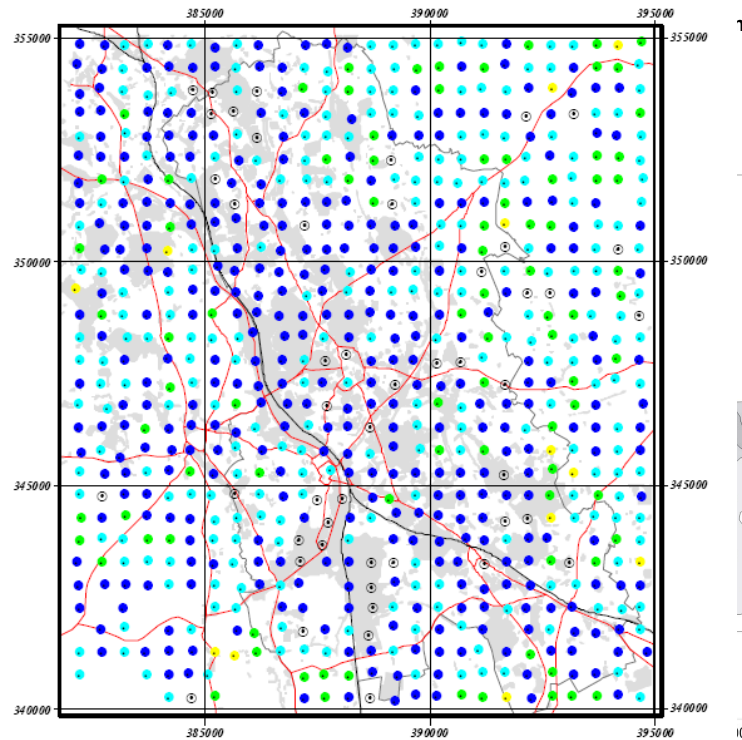
Nickel

BGS Urban Geochemistry
Report IR0135R

Leaching potential

Sub_ni.shp

- ⊙ Missing data
- None
- Very low
- Low
- Moderate
- High
- Very high



Recent uses for environmental samples and database

- regional geochemical maps
- archaeology
- forensic geochemistry
- geological mapping
- veterinary studies
- human health and nutrition
- EC legislative drafting
- environment protection strategies
- general public enquiries
- mineral exploration
- isotopic provenancing