British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

G-BASE Geochemical Baseline Survey Of the Environment

Generic information to accompany geochemical data licensed by the G-BASE (Geochemical Baseline Survey of the Environment) project of the British Geological Survey for SW England.

Regional geochemical data

Shallow (5-20cm) soils, and stream sediments.

Sample density

Stream sediments – average of 1 sample per 2.5km sq

Soils – average of 1 sample per 3km sq. Density is variable with a maximum of 1 sample per 2km sq and minimum of 1 sample per 5km sq, depending upon underlying parent material.

Geographical coordinates

The geographical co-ordinates supplied with the data are six figure Eastings and Northings in metres of the British National Grid.

Total concentrations of elements in soil and stream sediment samples

Soil sampling methodology: As far as possible, samples were collected away from any potential source of contamination, such as habitation, industrial activity or roads. Each soil sample is a composite of 5 samples collected at the corner and centre of a square with a side length of 20 m using a hand-held soil auger. Surface soil samples are collected from 5-20 cm depth of the mineral soil after removal of surface organic material. Samples are dried and then sieved to minus 2 mm.

Stream sediment sampling methodology: As far as possible, samples were collected from active sediment, upstream of any potential source of contamination, such as habitation, industrial activity or any road or track crossing. The sediment sample was then collected after removal of the oxidised surface material and was wet-screened on site. This method uses a minimum of water to collect the fraction of sediment finer than 150 µm. Approximately 100 g of material was collected into a Kraft paper bag.

Preparation and analysis: Samples of soil or sediment are coned and quartered, and a 50 g subsample ground in an agate planetary ball mill. They have been analysed by X-Ray Fluorescence Spectrometry. Additionally, loss on Ignition (LOI) and pH using a slurry of 0.01 M $CaCl_2$ are determined in soil samples.

Elements and parameters: Table below lists elements and parameters that are currently being determined in soil and sediment samples.

Symbol	Chemical Element name	Symbol	Chemical Element name
Ag	Silver	Nb	Niobium
Al	Aluminium	Nd	Neodymium
As	Arsenic	Ni	Nickel
Ba	Barium	P	Phosphorus
Bi	Bismuth	Pb	Lead
Br	Bromine	Rb	Rubidium
Ca	Calcium	S	Sulphur
Cd	Cadmium	Sb	Antimony
Ce	Cerium	Sc	Scandium
Cl	Chlorine	Se	Selenium
Co	Cobalt	Si	Silicon
Cr	Chromium	Sm	Samarium
Cs	Caesium	Sn	Tin
Cu	Copper	Sr	Strontium
Fe	Iron	Ta	Tantalum
Ga	Gallium	Te	Tellurium
Ge	Germanium	Th	Thorium
Hf	Hafnium	Ti	Titanium
Hg	Mercury	Tl	Thallium
I	Iodine	U	Uranium
In	Indium	V	Vanadium
K	Potassium	W	Tungsten
La	Lanthanum	Y	Yttrium
Mg	Magnesium	Yb	Ytterbium
Mn	Manganese	Zn	Zinc
Mo	Molybdenum	Zr	Zirconium
Na	Sodium		

Soils only

Symbol	Parameter
pH	Soil pH
LOI	Loss on Ignition at 450˚C

Average detection limits for sediments and soils

Element	XRF
Ag	0.5
Al_2O_3	0.2%
As	0.9
B	n/a
Ba	1
Be	n/a
Bi	0.3
Br	0.8
CaO	0.05%
Cd	0.5
Ce	1
Cl	200
Co	1.5
Cr	3
Cs	4
Cu	1.3
Fe_2O_3	0.05%
Ga	1
Ge	0.5
Hf	1
Hg	0.5
I	0.5
In	0.5
K_2O	0.01%
La	1
Li	n/a
MgO	0.3%
Mn	40
Mo	0.2

Element	XRF
Na_2O	0.3%
Nb	1
Nd	4
Ni	1.3
P_2O_5	0.05%
Pb	1.3
Rb	1
S	1000
SO_3	0.5%
Sb	0.5
Sc	3
Se	0.2
SiO_2	0.1%
Sm	2
Sn	0.5
Sr	1
Ta	1
Te	0.5
Th	0.7
TiO_2	0.02%
Tl	0.5
U	0.5
V	3
W	0.6
Y	1
Yb	1.5
Zn	1.3
Zr	1

All units are in mg/kg except where indicated.

Description of qualifier symbols

Code	Translation	Definition
>	Probably high	Not determined accurately due to interference. Probably higher.
<	Probably low	Not determined accurately due to interference. Probably lower.
^	No estimate possible	Not determined due to interference. No estimate possible.
*	Dubious quality	The value has a documented quality control issue that should restrict its use
#	Estimated value	Value reported was below the lower detection limit cited by the analyst and has been set to half this detection limit.
$	Uncertain value	Value as reported was below the lower detection limit cited by the analyst.
&	Uncertain quality	No information exists regarding quality of this data.
!	Not available	Applicable, but no value available.
?	Not entered	No value has yet been assigned, and may not be applicable.
~	Insufficient sample	Insufficient sample for analysis.
D	Uncertain value	Both $ and * apply to this value.
\	Not applicable	Not requested.
B	Estimated value	Both # and A apply to this value
A	Estimated value	Value has been set to zero because data conditioning process created an artificial negative value.
C	Uncertain value	Both $ and A apply to this value.

Further questions?

Any queries regarding geochemical data provided by the G-BASE project should, in the first Instance, be directed to BGS enquiries (enquiries@bgs.ac.uk) or phone: 0115 9363100). For Further information visit www.bgs.ac.uk/gbase