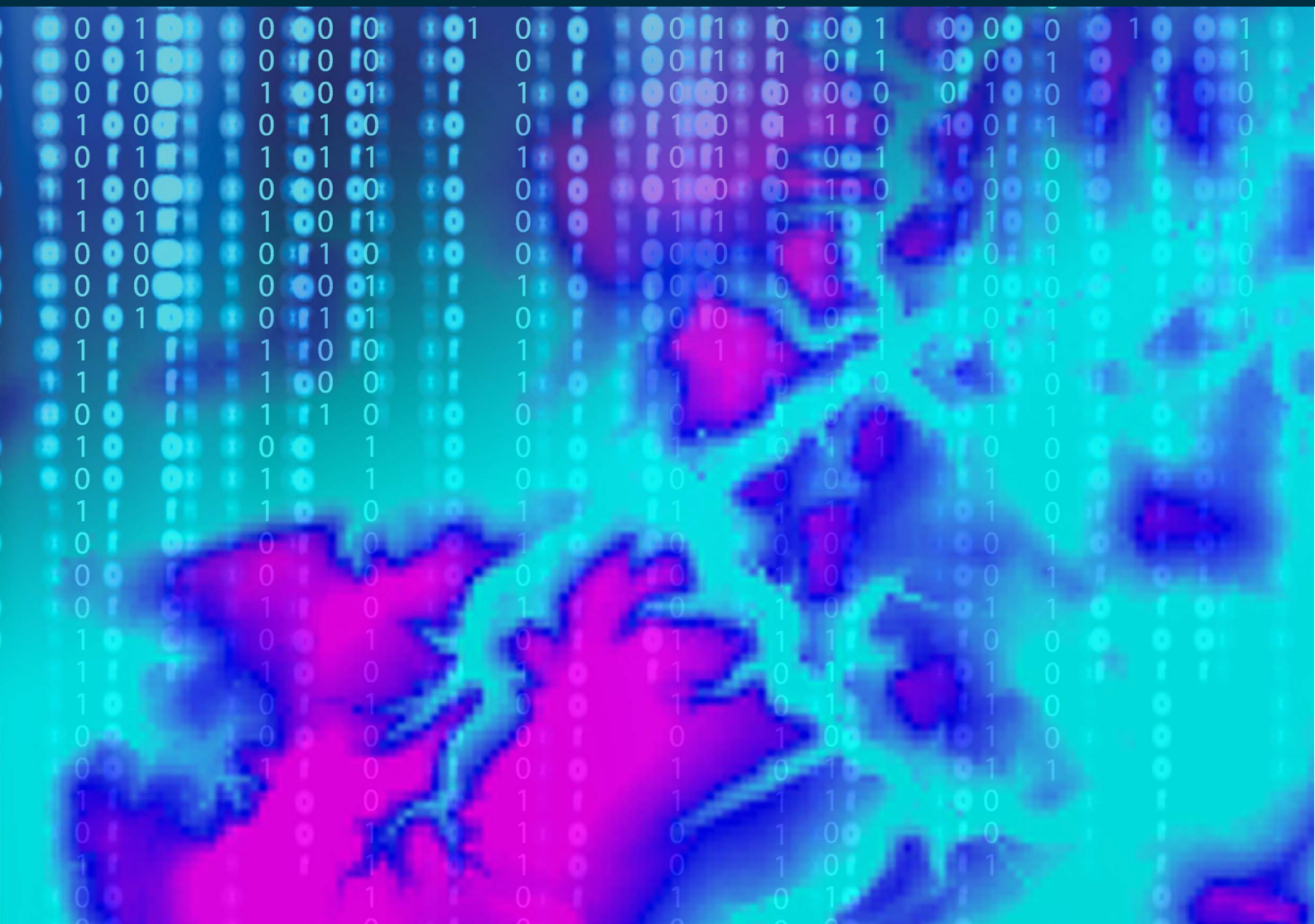
British Geological Survey

BRITISH GEOLOGICAL SURVEY

BGS products portfolio



BGS products portfolio

Keywords

Keyworth, Nottingham British Geological Survey 2024

BRITISH GEOLOGICAL SURVEY

The full range of our publications is available from BGS shops at Nottingham, Edinburgh, London and Cardiff (Welsh publications only) see contact details below or shop online at www.geologyshop.com

The London Information Office also maintains a reference collection of BGS publications, including maps, for consultation.

We publish an annual catalogue of our maps and other publications; this catalogue is available online or from any of the BGS shops.

The British Geological Survey carries out the geological survey of Great Britain and Northern Ireland (the latter as an agency service for the government of Northern Ireland), and of the surrounding continental shelf, as well as basic research projects. It also undertakes programmes of technical aid in geology in developing countries.

The British Geological Survey is a component body of UK Research and Innovation.

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Contents

1. Geology datasets

1.1. BGS geology 10k

Scale 1:10 000

Coverage Partial Great Britain coverage

Format GIS line and polygon data (ESRI, MapInfo, others available by request)

Price £1.50 per km^2. Subject to number of users, licence fee and data preparation fee.

Website link https://www.bgs.ac.uk/products/digitalmaps/DiGMapGB_10.html

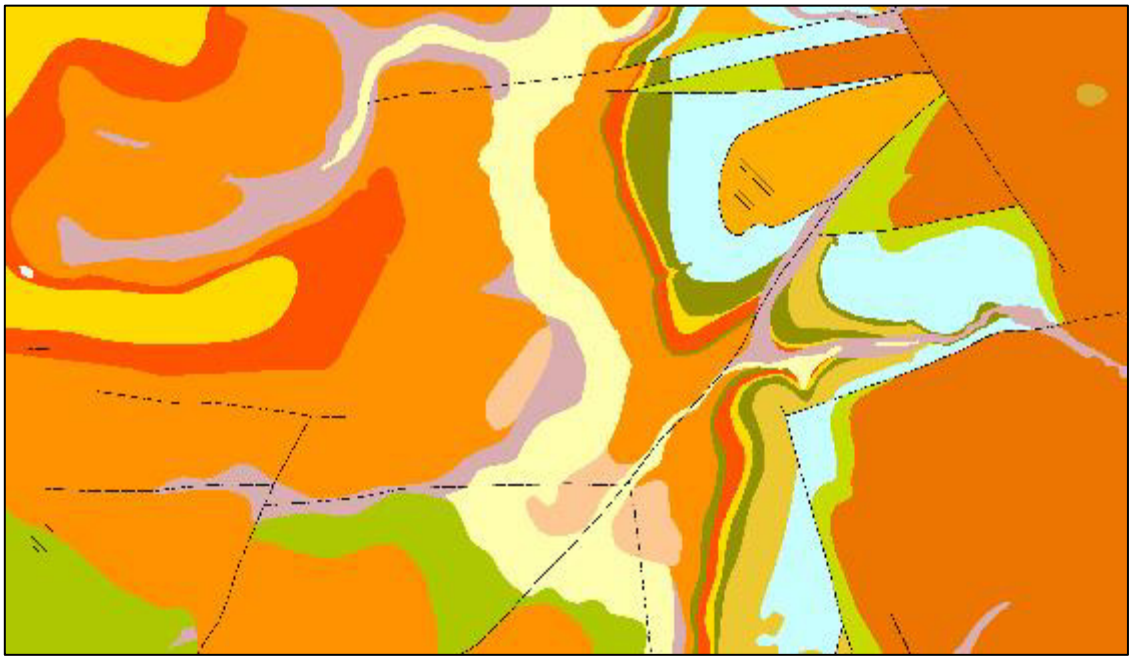
Detailed digital geological map data based on BGS's National Grid and County series 1:10 000 and 1:10 560 scale (six-inch to one-mile) maps with updated nomenclature.

Many BGS geology maps are now available digitally. The Digital Geological Map of Great Britain project (BGS Geology) has prepared 1:625 000, 1:250 000 and 1:50 000 scale datasets for England, Wales and Scotland. Work continues to upgrade these and to extend the coverage of the most-detailed 1:10 000 scale dataset.

Many existing 'paper-only' maps have been digitised, and the nomenclature, particularly of older maps, updated to current usage.

The geological areas (or polygons) are labelled or attributed with a name (based on their lithostratographical, chronostratographical or lithodemic nomenclature) and their composition (rock type or lithology). This information is arranged in up to four themes as available: bedrock geology; superficial deposits; mass movement; and artificial ground. Faults and other linear features are available in a separate theme.

Geology maps are the foundation for many other types of earth science related maps and are of potential use to a wide range of customers.



BGS Geology 10k (1:10 000)

1.2. BGS geology 50k

Scale 1:50 000

Coverage Most of Great Britain

Format GIS lines and polygon data (ESRI, MapInfo, others available by request)

Price 20p per km^2. Subject to number of users, licence fee and data preparation fee.

Website link https://www.bgs.ac.uk/products/digitalmaps/DiGMapGB_50.html

Map viewer http://mapapps.bgs.ac.uk/geologyofbritain/home.html

WMS http://maps.bgs.ac.uk/ArcGIS/services/BGS_Detailed_Geology/MapServer/WMSServer

Generalised digital geological map data based on BGS's New Series 1:50 000 and 1:63 360 scale (one-inch to one-mile) maps with updated nomenclature. Includes a few 1:100 000 scale maps of Orkneys and Hebrides.

Many BGS geology maps are now available digitally. The Digital Geological Map of Great Britain project (BGS Geology) has prepared 1:625 000, 1:250 000, 1:50 000 and 1:10 000 scale datasets for England, Wales and Scotland. Work continues to upgrade these.

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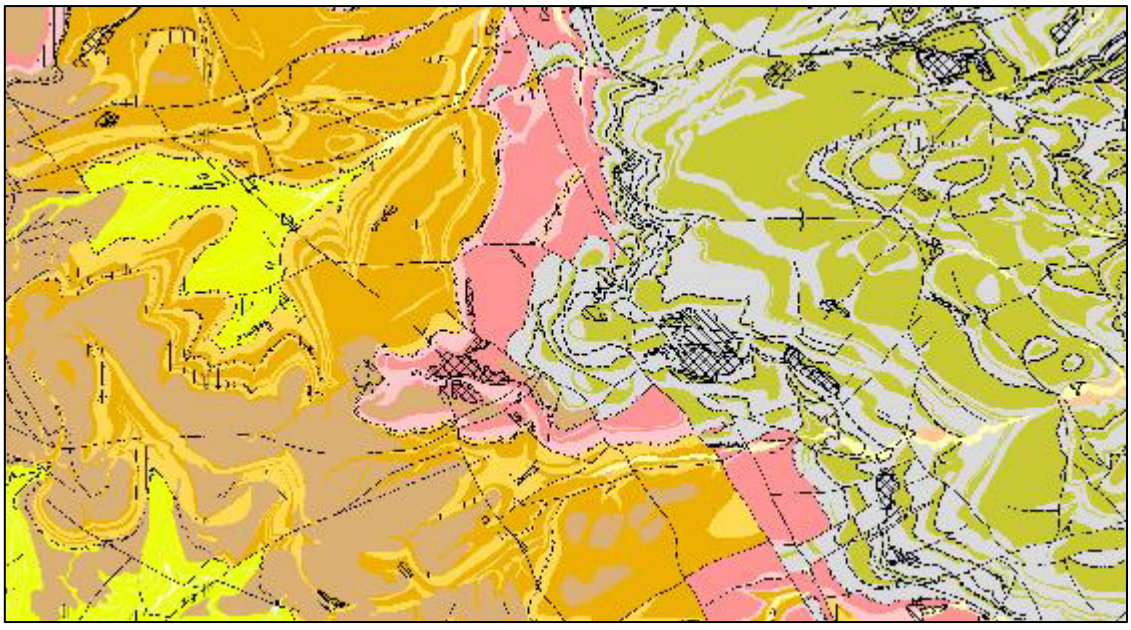


BGS Geology 50k (1:50 000)

Linear

Artificial

Mass movement

Superficial

Bedrock

1.3. BGS soil parent material model

Scale 1:50 000

Coverage Great Britain

Format GIS polygon data (ESRI, MapInfo, others available by request)

Price 30p per km^2. Subject to number of users, licence fee and data preparation fee.

Website link https://www.bgs.ac.uk/products/onshore/soilPMM.html

Map viewer http://mapapps2.bgs.ac.uk/geoindex/home.html

WMS http://www.bgs.ac.uk/data/services/soilwms.html

A parent material is a soil-science name for a weathered rock or deposit from, and within which a soil has formed. In the UK, parent materials provide the basic foundations and building blocks of the soil, influencing their texture, structure, drainage and chemistry.

The soil-parent material (PM) database is part of a series of GIS maps designed to help environmental scientists and consultants assess the characteristics of the 'near-surface' weathered zone. In particular, the dataset focuses upon the material from which top soils and subsoils (A and B horizons) develop (i.e. from the base of pedological soil down to c. 3 m).

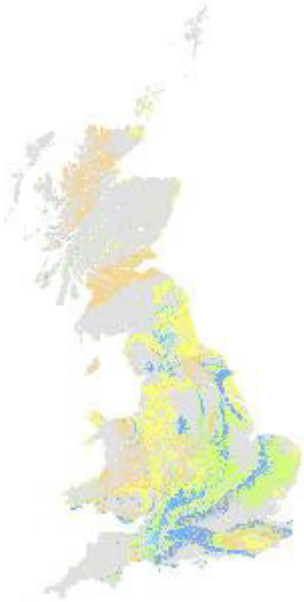
The PM database is a synthesis of several national and regional databases held by BGS, primarily BGS Geology 50k. The parent material dataset comprises a spatial layer with each map unit being described by fields of attribute data (Carbonate content, Estimated texture, Generalised lithology, Origin parent, Parent grouping, Parent material code, Soil group and Typical strength).

The Soil Parent Material Model details the distribution of physiochemical properties of the weathered and unweathered parent materials of the UK to:

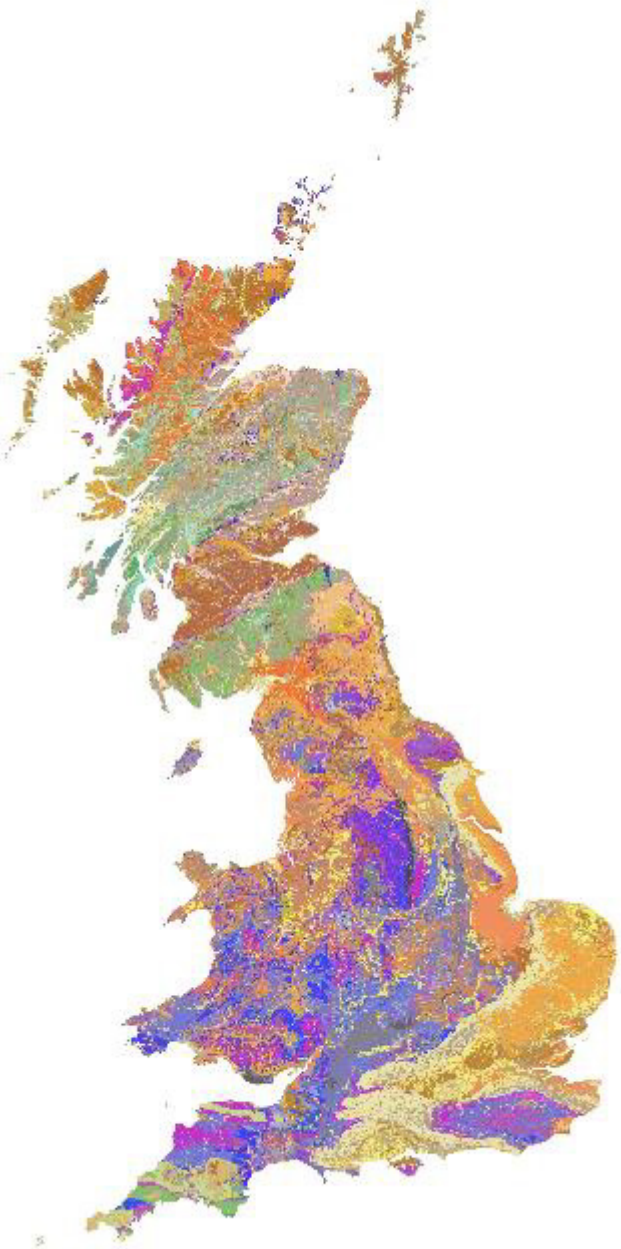
- facilitate spatial mapping of UK soil properties
- identify soils and landscapes sensitive to erosion
- provide a national overview of our soil resource
- develop a better understanding of weathering properties and processes

There are two versions of the Soil Parent Material model available:

- A licensable, 1:50 000 scale, version containing over 30 rock and sediment characteristics built upon the standard BGS Geology 50k geological dataset, adding simplified classifications of lithological properties. The attribute content includes a range of texture information, colour, structure, mineralogy, lithology, carbonate content and genetic origin.
- A free, 1 kilometre resolution model detailing 6 basic parent-material parameters (derived from the 1:50 000 scale version). The data is exactly the same as that used in the *my*Soil application.

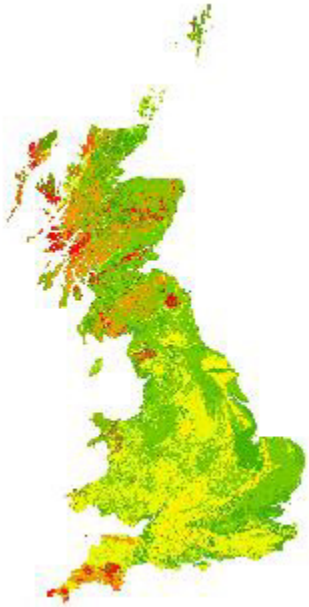


Carbonate content



Generalised lithology

Soil group (DEFRA)



Parent grouping

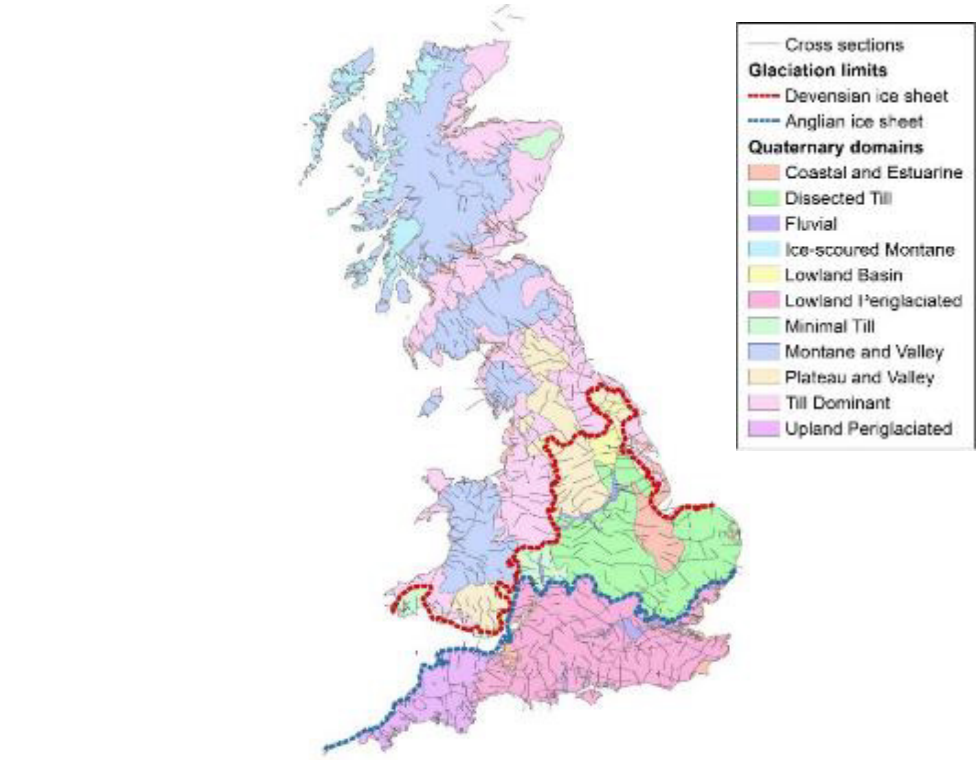
Typical strength

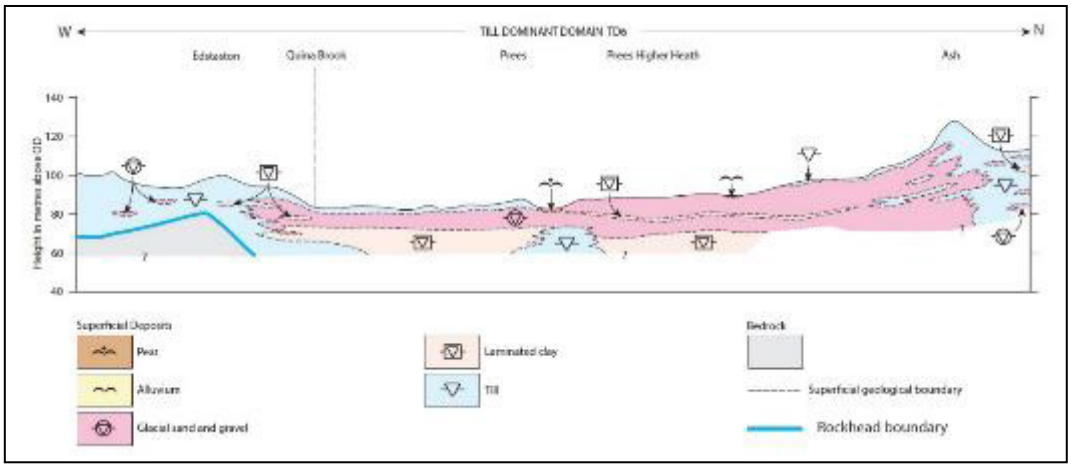
1.4. BGS Quaternary domains

Scale	1:625 000
Coverage	Most of Great Britain
Format	GIS polygon data (ESRI, MapInfo, others available by request)
Price	Free. Subject to number of users, licence fee and data preparation fee. Please acknowledge the material.

Map viewer http://mapapps2.bgs.ac.uk/quaternary/home.html

BGS recognises 11 different Quaternary domains forming glaciated and non-glaciated provinces of Great Britain. These domains are represented by consistent geomorphological features (landforms), with typical assemblages of superficial deposits. They are partly defined by the genetic processes that formed both the deposits and landforms.





1.5. BGS Geology: Superficial Deposits Thickness Model (SDTM)

Scale 1:50 000

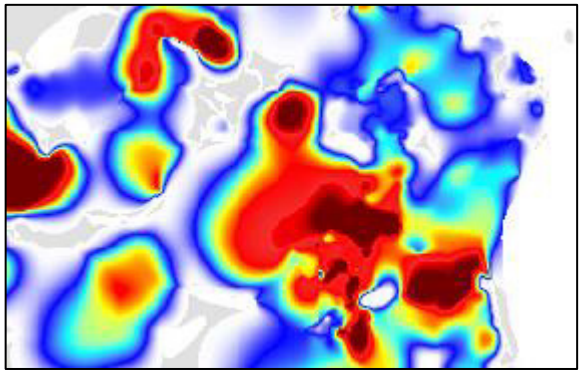
Coverage Great Britain

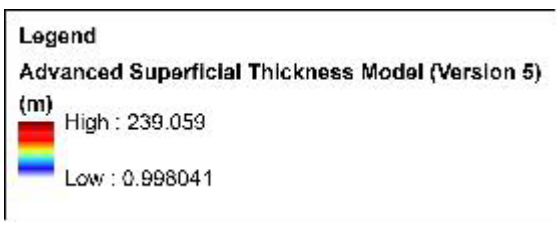
Format GIS grid data (ESRI, MapInfo, others available by request)

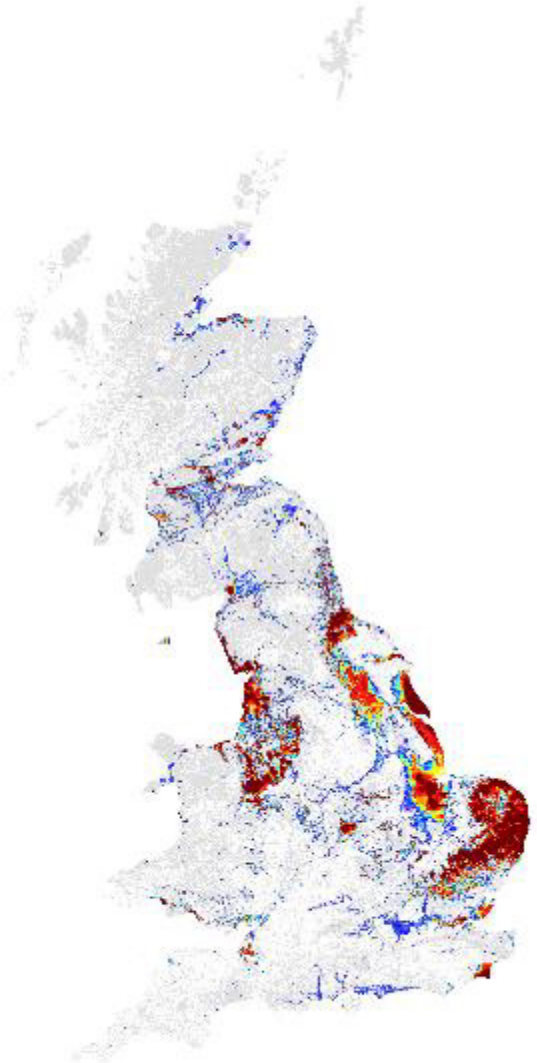
Price 15p per km^2. Subject to number of users, licence fee and data preparation fee.

Website link https://www.bgs.ac.uk/products/onshore/superficialThicknessModel.html

The Superficial Deposits Thickness Model (SDTM) is a raster-based dataset designed to demonstrate the variation in thickness of Quaternary-age superficial deposits across Great Britain. The grids are generated with a cell spacing of 50 m by 50 m, and data is aggregated by a 25 m radius (i.e. points located less than half a cell spacing from their neighbours are averaged). Quaternary deposits (all unconsolidated material deposited in the last 2.6 million years) are of particular importance to environmental scientists and consultants concerned with our landscape, environment and habitats. The BGS has been generating national models of the thickness of Quaternary-age deposits since 2001, and this latest version of the model is based upon BGS Geology 50k geological mapping and borehole records registered with BGS before August 2008.







1.6. BGS Geology: Superficial Deposits Thickness Model (SDTM) 1 km hex grid

Scale	1 km hex grid (approx. 1:1 000 000)
Coverage	Great Britain
Format	GIS grid data (ESRI)
Price	Free for commercial, research and public use under the Open Government Licence. Please acknowledge the material.

Website link https://www.bgs.ac.uk/products/onshore/superficialThicknessHex.html

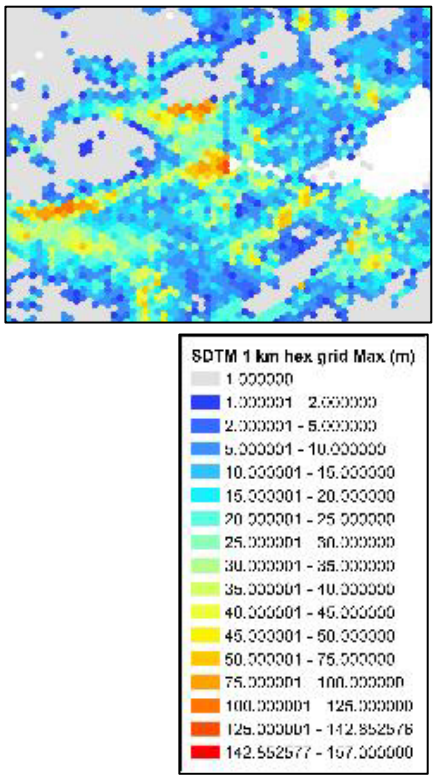
Superficial deposits are the youngest of the geological formations (less than 2.58 million years old). They are largely unconsolidated and cover much of the bedrock of Britain. They generally include sediments deposited during the Pleistocene (Quaternary) glacial episodes, subsequent Holocene rivers, and coastal systems; superficial deposits also include modern artificial deposits such as mining spoil and road embankments.

The BGS Geology: superficial deposits thickness model 1 km hex grid shows the variation of the thickness of superficial (Quaternary age) deposits across Great Britain.

The data are presented as a cellular vector map of interlocking hexagons (side length 1 km, area approximately 2.6 km^2) covering the landmass of Great Britain as a regular grid. Each hexagon is attributed with a series of statistics about the thickness of the underlying Quaternary units; additional information relating to the thickness models and the coverage of underpinning data is provided.

The data are derived by spatially summarising the information originally created for the high-resolution BGS Geology: Superficial Deposits Thickness Model.

This data can only be viewed within a GIS as a vector layer of information (and is supplied in several common GIS formats).



2. Engineering datasets

Scale	1:50 000
Coverage	Great Britain
Format	GIS lines and polygon data (ESRI, MapInfo, others available by request)
Price	50p per km^2 for all 8 layers. 30p per km^2 for each individual layer (Bulking, Corrosivity, Discontinuities, Excavatability, Fill, Foundations, Resistivity, Strength and Sulphate/Sulphide). Subject to number of users, licence fee and data preparation fee.

Website link https://www.bgs.ac.uk/products/groundConditions/civilsBundleHome.html

BGS Civils provides a wide range of value-added geological dataset and information civil engineering sector.

The dataset primarily provides key engineering characteristics of the geology of Great Britain, such as texture, structure, colour, mineralogy and engineering parameters in a way that is suitable for rapid deployment by engineers.

The dataset is provided as a series of attributes that are available to licence individually or as a personally selected a range of 'modules' to meet your own requirements. The dataset is normally supplied as a single GIS layer of 'surface-geology' compiled from the combined bedrock and superficial layers of BGS Geology 50k.

BGS Civils currently contains information on

- Bulking of soils and rocks
- Corrosivity (soils with potentially 'corrosive' or 'aggressive' characteristics)
- Discontinuities
- Excavatability
- Use for engineered fill
- Foundation conditions
- Resistivity
- Engineering strength
- Sulphate and sulphide potential

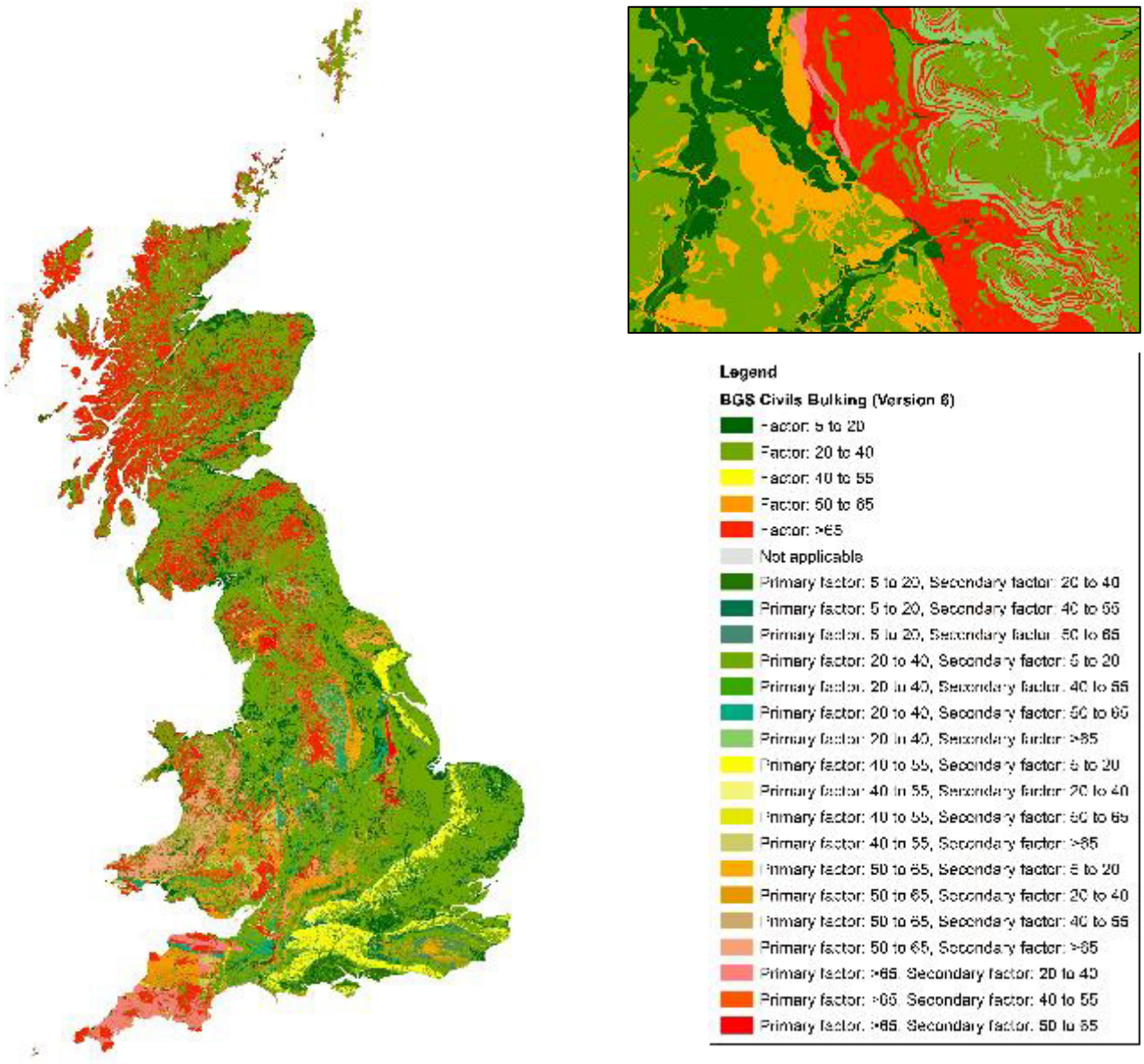
2.1. BGS Civils: bulking volume

Website link https://www.bgs.ac.uk/products/groundConditions/BulkingVolume.html

This theme classifies geological deposits at surface by their likely bulking factor. Bulking occurs when a geological material is excavated and the volume of disturbed material is different to the volume of the excavated hole.

The spatial model covers Great Britain at 1:50 000 scale and is based upon the lexicon (LEX), rock classification scheme (RCS) and estimations of bulking factor values (available from literature review and web based resources).

The 'bulking of excavated material' of rocks and soils is an important consideration in civil engineering and extractive industries. The change in volume between in situ material and excavated material has implications for storing material in stockpiles on-site or moving it off-site.



2.2. BGS Civils: corrosivity (ferrous)

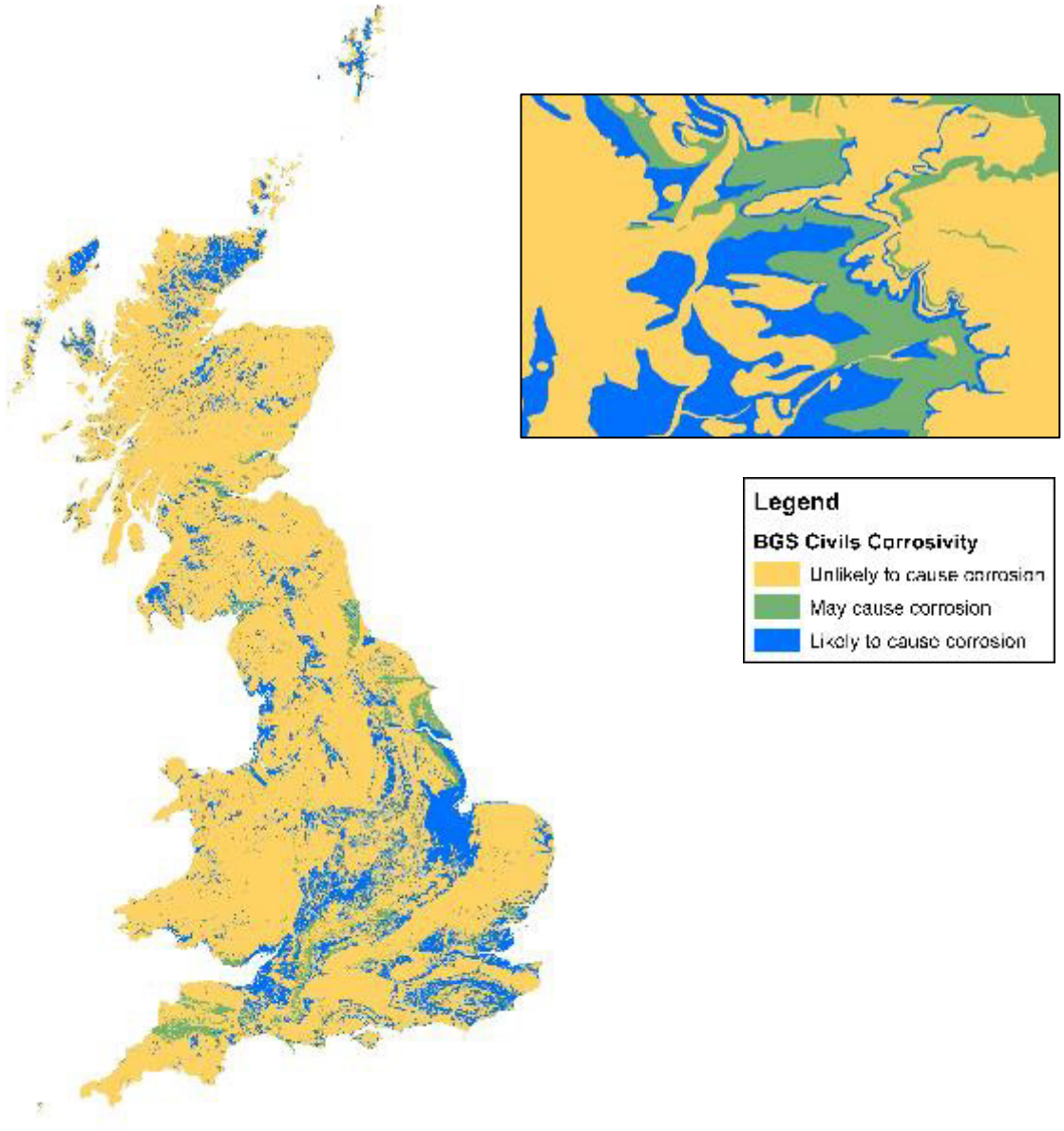
Website link https://www.bgs.ac.uk/products/groundConditions/corrosivity.html

As underground structures and pipes get older, their potential to fail as a result of surface pitting and corrosion increases. The cost in the UK of corrosion to these structures has been estimated at four per cent of GNP per year (Institute of Corrosion).

Some of this cost comes in the form of corrosion to underground iron structures (e.g. pipes), particularly in what are termed 'aggressive soils'.

The BGS corrosivity dataset is a GIS layer supporting the management of underground iron assets that has been created in response to the growing awareness of the cost of maintenance of structures such as pipelines and building foundations.

This dataset identifies where the ground beneath the topsoil has potentially 'corrosive' or 'aggressive' characteristics and places them within the recognised scoring framework developed by the Cast Iron Pipe Research Association (CIPRA) now the Ductile Iron Pipe Research Association (DIPRA).



2.3. BGS Civils: discontinuities

Website link https://www.bgs.ac.uk/products/groundConditions/discontinuities.html

This theme provides information on the discontinutites in bedrock and superficial deposits as part of a suite of GIS layers for different engineering parameters.

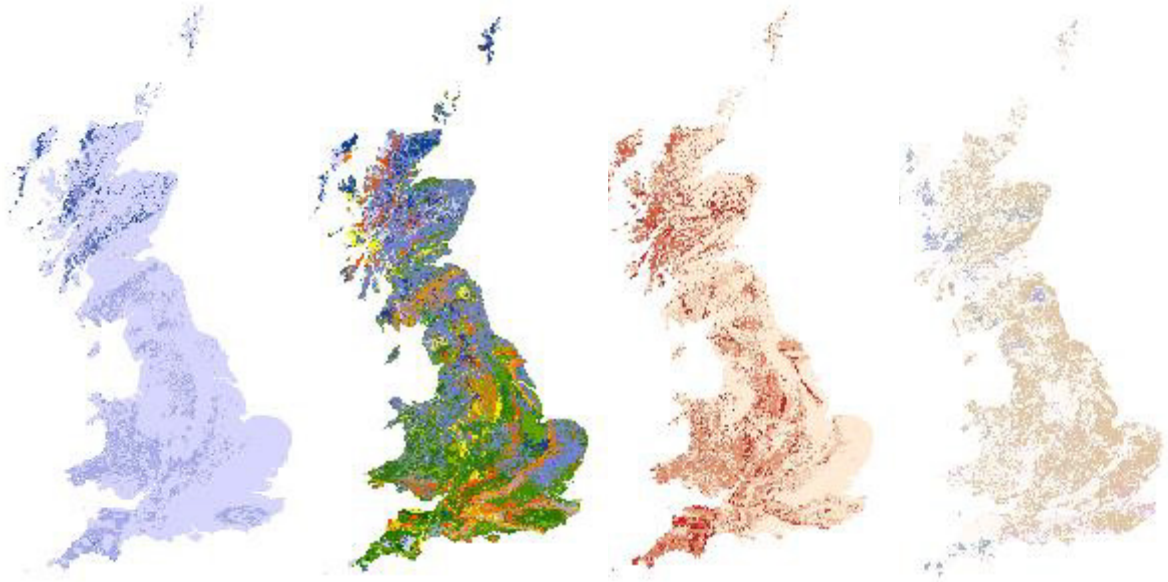
The spatial model covers England, Scotland and Wales at 1:50 000 scale and is based upon bedrock and superficial geology from BGS Geology 50k.

Discontinuities within rocks and soils are an important factor in all engineering activities.

The discontinuity parameters proposed for attributing the BGS Civils: discontinuities dataset are:

- stratification planes: lamination, bedding and layering
- foliation: bedding plane fissility/slaty cleavage, lineation/linear schistosity, schistose foliation, gneissose foliation
- rock mass: massive, blocky, tabular, columnar and irregular
- additional discontinuities: fissured, sheared, sheet/exfoliation joints

As previously stated, not all stratification planes and foliation planes are mechanical discontinuities. However, it would not be possible to differentiate between those which are and those which are not at the scale proposed. As such, it is proposed that all potential discontinuities within the rock mass be described.



Foliation Structure Rock mass Additional

2.4. BGS Civils: engineered fill

Website link https://www.bgs.ac.uk/products/groundConditions/engineeredFill.html

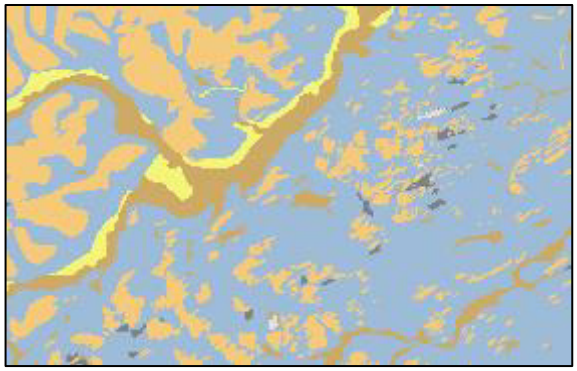
This theme provides information on the suitability of a geological material to be used as engineered fill.

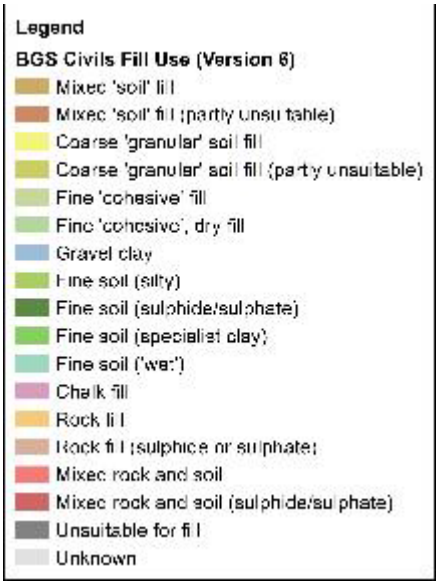
The spatial model covers England, Scotland and Wales at 1:50 000 scale using data from the following BGS datasets:

- Soil Parent Material Map
- National Geotechnical Properties Database (NGPD)
- Britpits

The use of engineering fill is an important consideration in the civil engineering and extractive industries. The rapidly increasing cost of removing material off-site, and especially disposal of unused material, means that a great deal of effort is now taken to identify if and how these materials can be used on-site.

The classification for the engineered fill theme primarily follows the Highways Agency classification but is also informed by expert judgement and methods previously used by the BGS. The description of the classification can be found in the free downloadable user guide.





2.5. BGS Civils: excavatability

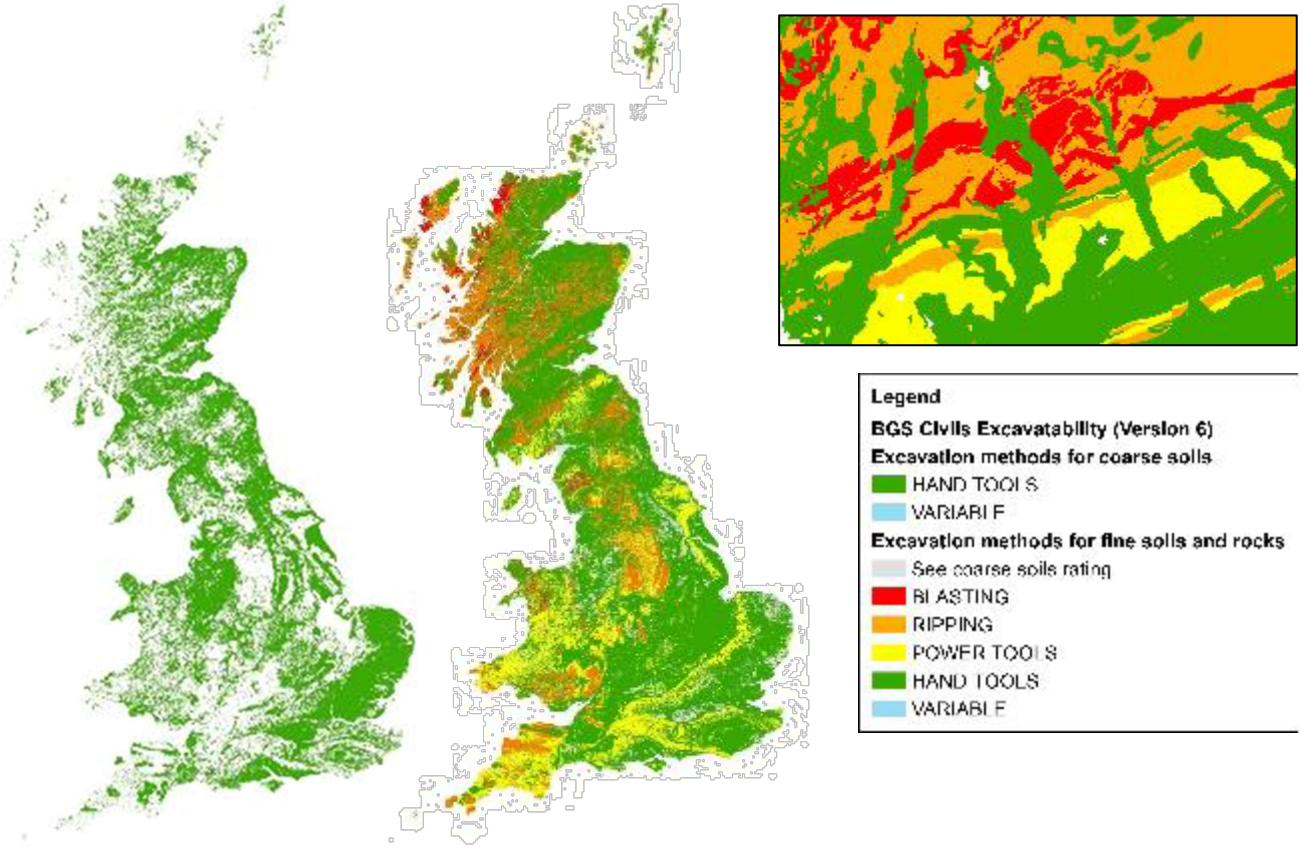
Website link https://www.bgs.ac.uk/products/groundConditions/excavatability.html

This theme provides information on the excavatability of geological deposits at surface. The values supplied are the indicative minimum, maximum and typical values we would normally expect to encounter per geological unit but limited to the top 2–3 m.

The spatial model covers England, Scotland and Wales at 1:50 000 scale and is based upon bedrock and superficial geology from BGS Geology 50k, archive data of engineering soil strength from the National Geotechnical Properties Database (NGPD) coupled with the Soil Parent Material Map and displayed via dictionaries of 'excavatability classes'.

Excavations are dug for a range of civil engineering purposes including cuttings, borrow pits and quarries. Typically excavations to 2–3 m are for foundations, utilities infrastructure, cellar construction, grading and burial pits.

The categorisation of excavatability is based on strength data collated for geological formations as identified in the BGS lexicon and rock classification scheme (LEX-RCS). The strength data is derived from the BGS Civils: strength dataset and is derived from the British Standards Institute (1999) code of practice for site investigation (amended in 2003 and 2009). The classification has been further subdivided to account for regional/lateral geological variation where sufficient data exists. The degree of weathering of the geological unit has also been incorporated where possible. This dataset will be updated to include the new BGS Civils: discontinuities information during 2015.



2.6. BGS Civils: foundations conditions

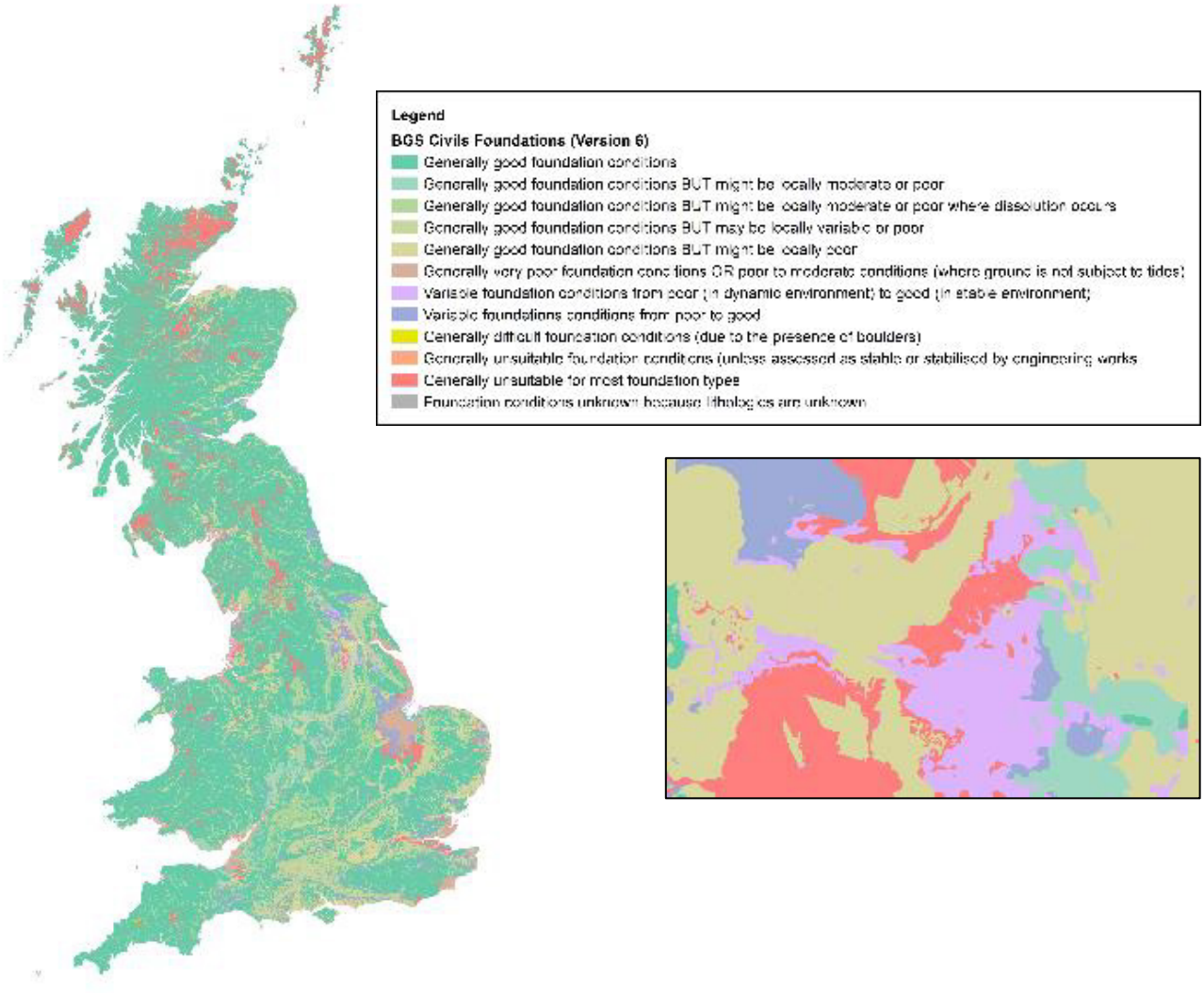
Website link https://www.bgs.ac.uk/products/groundConditions/foundationConditions.html

This theme provides information on the suitability of a geological material for foundations as part of a suite of GIS layers for different engineering parameters.

The spatial model covers England, Scotland and Wales at 1:50 000 scale and is based upon the Soil Parent Material Map, the National Geotechnical Property Database (NGDP) and BGS Geology 50k dataset. It characterises bedrock and superficial deposits in terms of their engineering properties related to the suitability for foundations.

The foundation conditions of rocks and soils are an important consideration for determining how surface construction loads are transmitted into the ground safely and for the lifespan of the project.

The primary classifiers give a qualitative assessment of the likely ground conditions for foundations. This is based on characteristics including bearing capacity (strength), compressibility, rate of consolidation and the variability of the ground conditions for each unit. A special case for construction above mapped coal seams is also given, and this is also relevant for units that contain coal seams. In these cases this is one of the subsets.



2.7. BGS Civils: resistivity

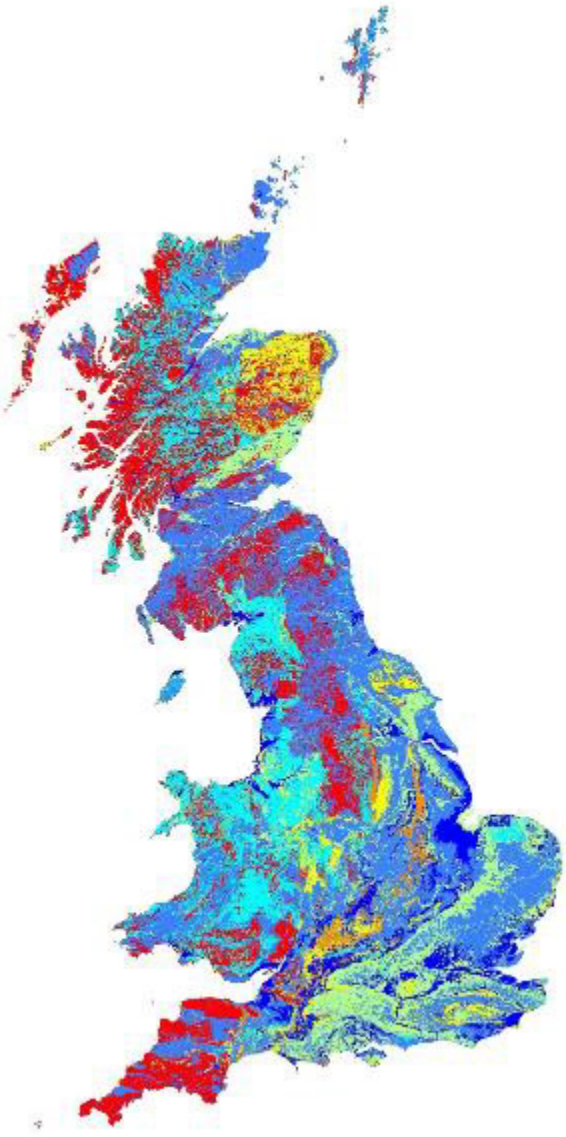
Website link https://www.bgs.ac.uk/products/groundConditions/resistivity.html

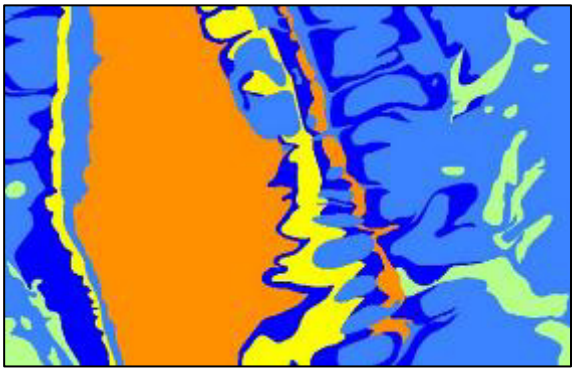
This theme provides information on the electrical resistivity of a geological material to be used where the earthing characteristics of the ground are required.

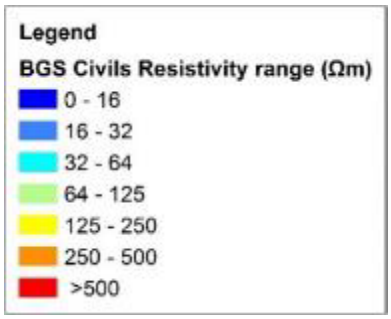
The spatial model covers England, Scotland and Wales at 1:50 000 scale using data from the following BGS datasets: Soil Parent Material Map, the National Geotechnical Property Database (NGDP) and the Geophysical Laboratories Database.

The resistivity of geological units is an important factor in engineering activities where the electrical characteristics of the ground are required, e.g. in earthing of electrical systems. The resistivity of the ground is dependent on a number of factors including pore water resistivity, saturation and the clay content of the underlying geology.

The Soil Parent Material Map of Great Britain, which describes the geology of the near surface, has been classified with modelled values of electrical resistivity. The description of the classification can be found in the free downloadable user guide.







2.8. BGS Civils: strength

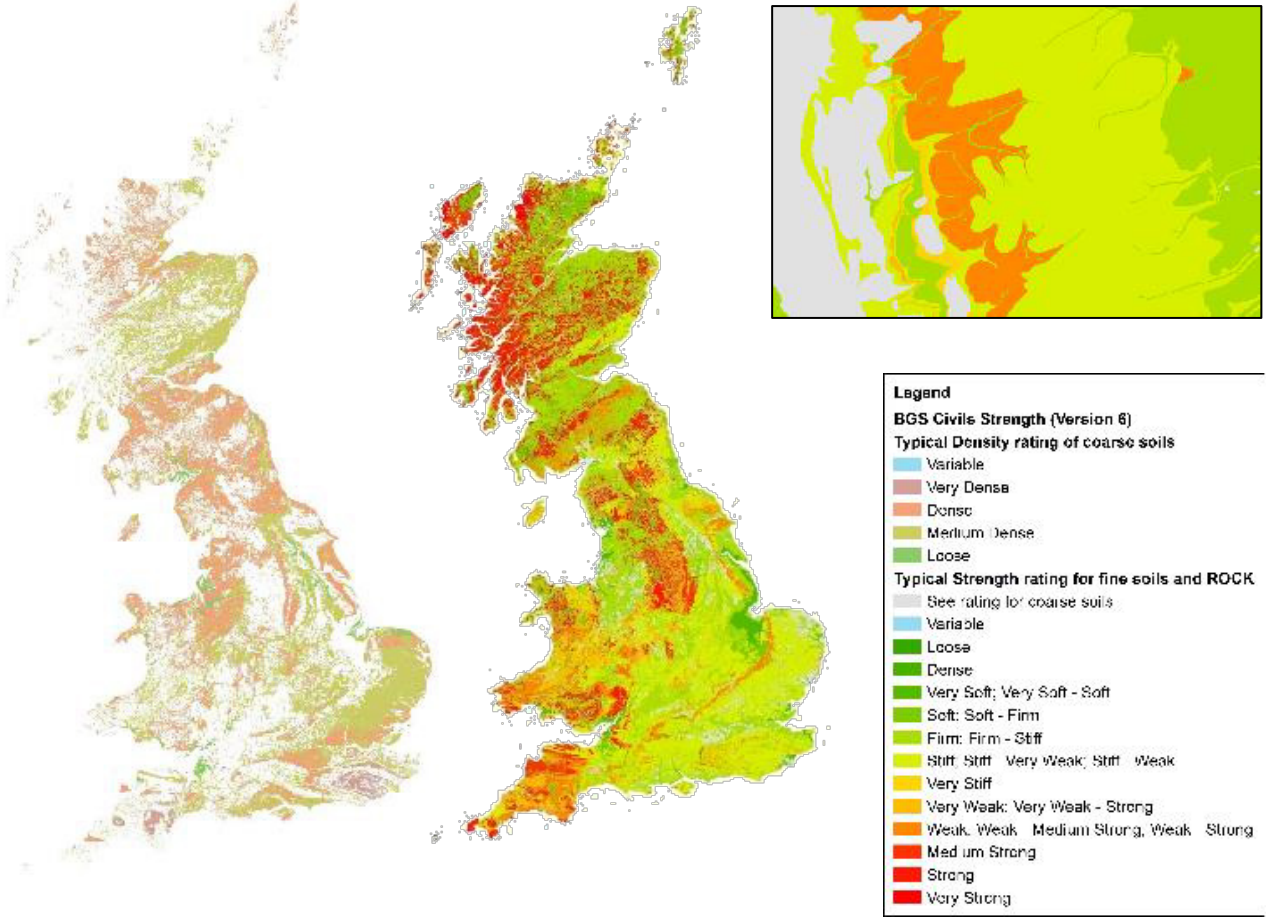
Website link https://www.bgs.ac.uk/products/groundConditions/strength.html

This theme provides information on zones of rock strength and the local factors controlling it, as part of a suite of GIS layers for different engineering parameters.

The spatial model covers England, Scotland and Wales at 1:50 000 scale and is based upon archive data of engineering soil strength from the National Geotechnical Properties Database (NGDP) coupled with the BGS Geology 50k dataset.

The strength of rocks and soils is an important factor in all engineering activities.

Definitions of the engineering strength of rocks and fine soils are provided as minimum, maximum and typical strengths; definitions of the engineering strength of coarse soils are provided as minimum, maximum and typical densities. This tri-fold classification allows for the wide range of variation encountered within some stratigraphic units. The classification used in the dataset is based upon the British Standard 5930 (1999) code of practice for site investigation (modified 2003 and 2009).



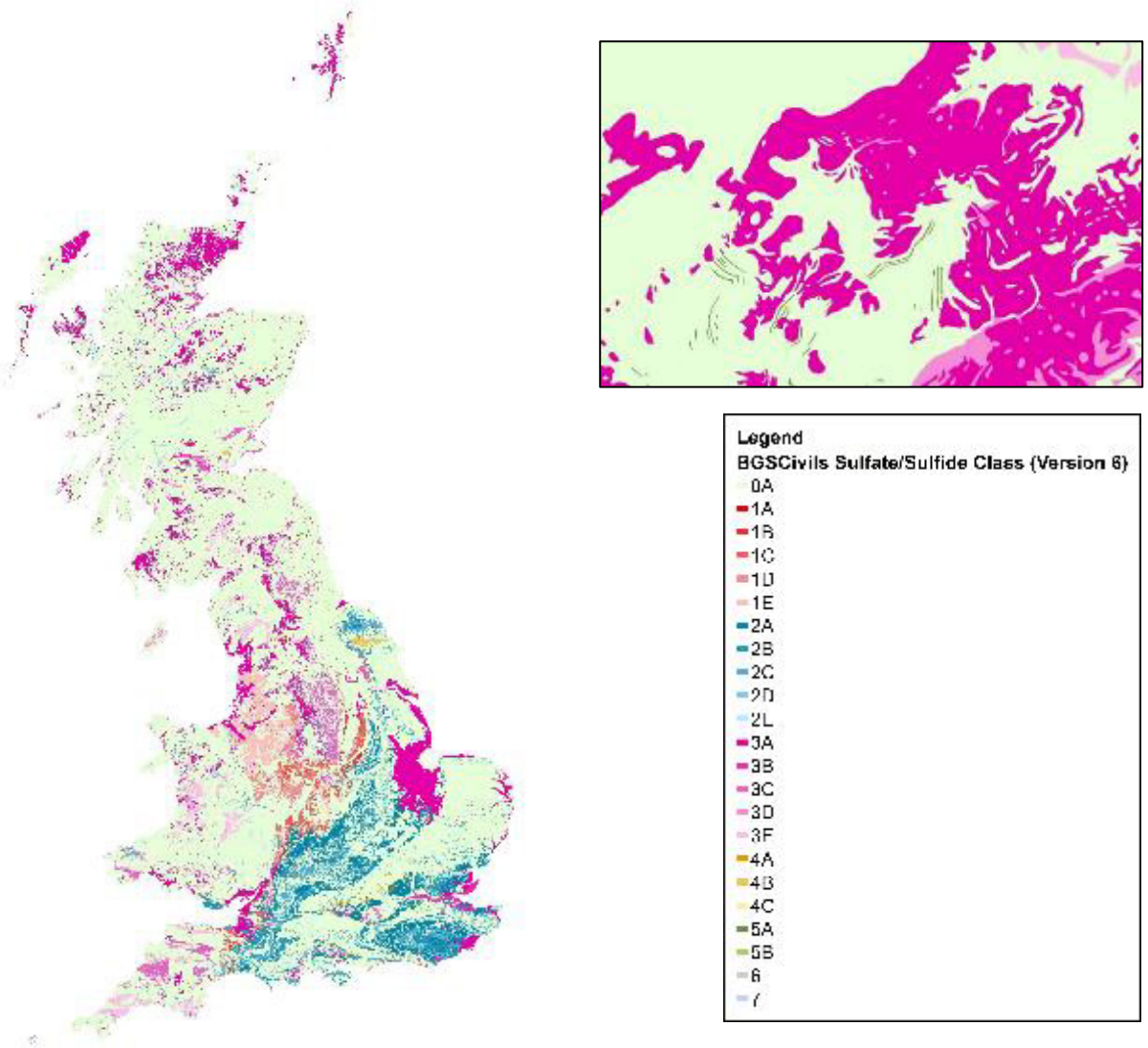
2.9. BGS Civils: sulfate/sulfide potential

BGS website link https://www.bgs.ac.uk/products/groundConditions/sulfateSulfidePotential.html

Sulfates and sulfides in rocks and soils are, when in certain forms and in certain conditions, of importance to the engineered environment as they can give rise to aggressive ground conditions. Sulfate ions react with some types of cement and concrete, weakening it (mostly in slightly acid to alkali conditions). Sources of sulfate ions are primarily from gypsum (calcium sulfate), which is an evaporite deposit found in certain geological units, and from to the oxidation usually of very fine-grained iron sulfide (framboidal iron pyrites).

The BGS Civils: sulfates and sulfides dataset is a GIS layer supporting the management of underground assets that has been created in response to the growing awareness of the cost of maintenance of structures such as pipelines and building foundations.

This dataset provides a guide to the potential sulfate/sulfide geohazard for geological units found at surface for Great Britain. It can be used as an indicator of primary sulfate and the potential presence or likely formation of sulfate species due to oxidation. It should be considered as a part of desk study for civil engineering purposes to inform the intrusive ground investigation and construction in the ground.



3. Ground stability datasets

3.1. BGS GeoSure

Scale	1:50 000
Coverage	Great Britain
Format	GIS polygon data (ESRI, MapInfo, others available by request)
Price	80p per km^2 for all 6 themes. Individual themes: Collapsible Deposits 5p per km^2, Compressible Ground 20p per km^2, Landslides 30p per km^2, Running Sands 20p per km^2, Shrink Swell 30p per km^2, Soluble Rocks 15p per km^2. Subject to Licence Fee and Data Preparation Fee.

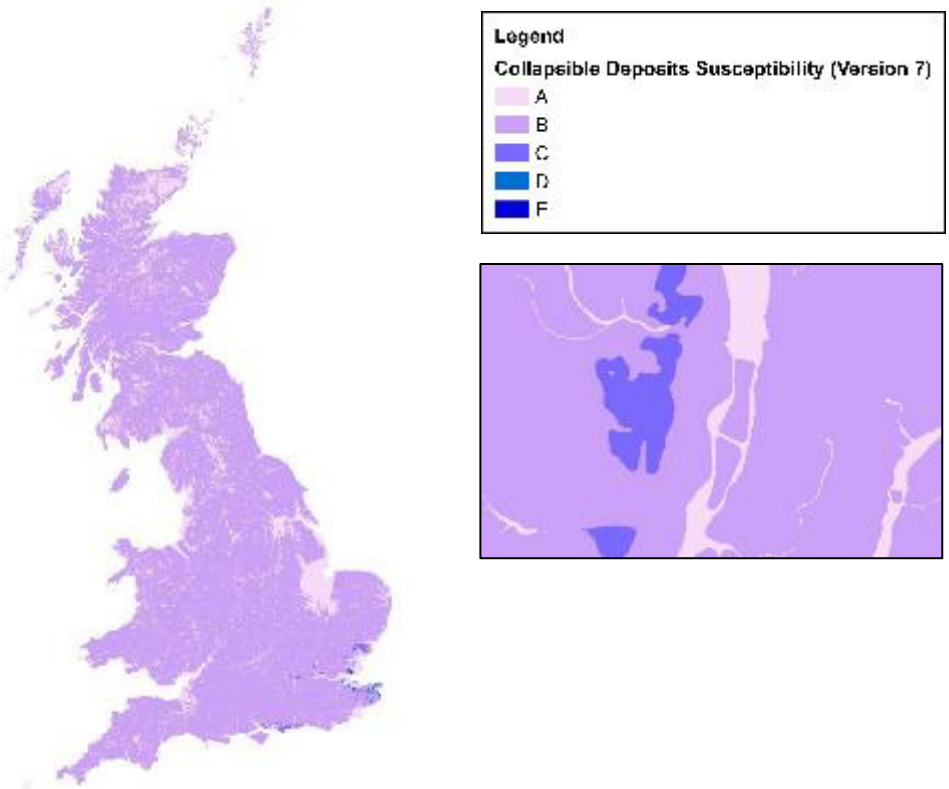
Website link https://www.bgs.ac.uk/products/geosure/home.html

GeoSure national datasets provide geological information about potential ground movement or subsidence that can help planning decisions.

Collapsible deposits

Some kinds of natural deposit can collapse, i.e. they undergo a rapid reduction in volume, when a load (such as a building) is placed on them and they become saturated with water. Such collapse can cause damage to property.

If the material below a building collapses it may cause the building foundations to rapidly subside. If the ground collapses unevenly, the resulting damage may be more severe than that caused by a uniform collapse.

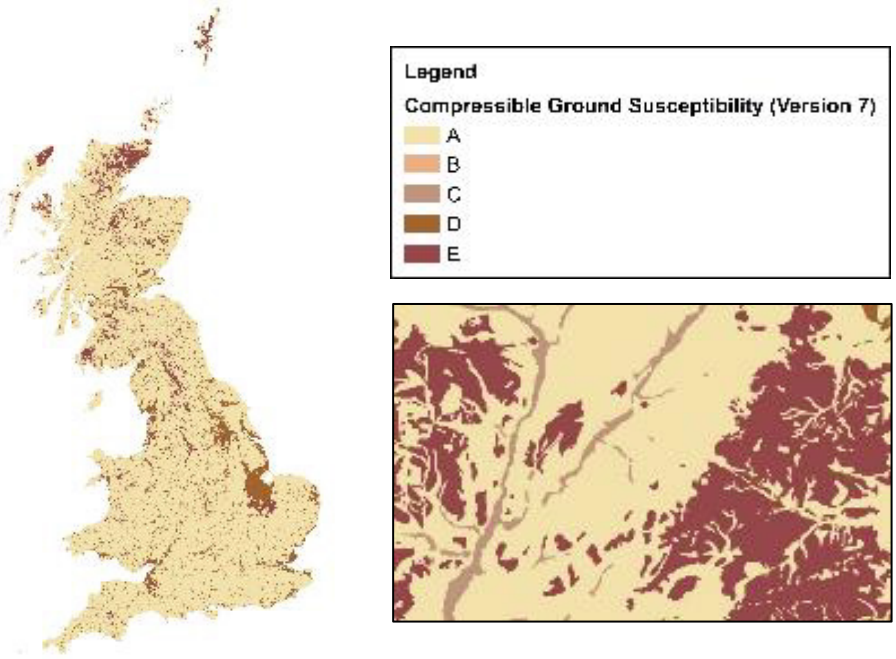


Compressible ground

Some types of ground, may contain layers of very soft materials like clay or peat. These may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Ground is compressible if an applied load, such as a house, causes the fluid in the pore space between its solid components to be squeezed out causing it to decrease rapidly in thickness (compress). Peat, alluvium and laminated clays are common types of deposits associated with various degrees of compressibility. The deformation of the ground is usually a one-way process that occurs during or soon after construction.

If ground is extremely compressible the building may sink below the surface of the surrounding ground or relative to adjacent structures that apply lesser or greater loads to the ground. If the compressible ground is not uniform different parts of the building will sink at different rates or by different amounts (differential settlement).



Landslides (slope instability)

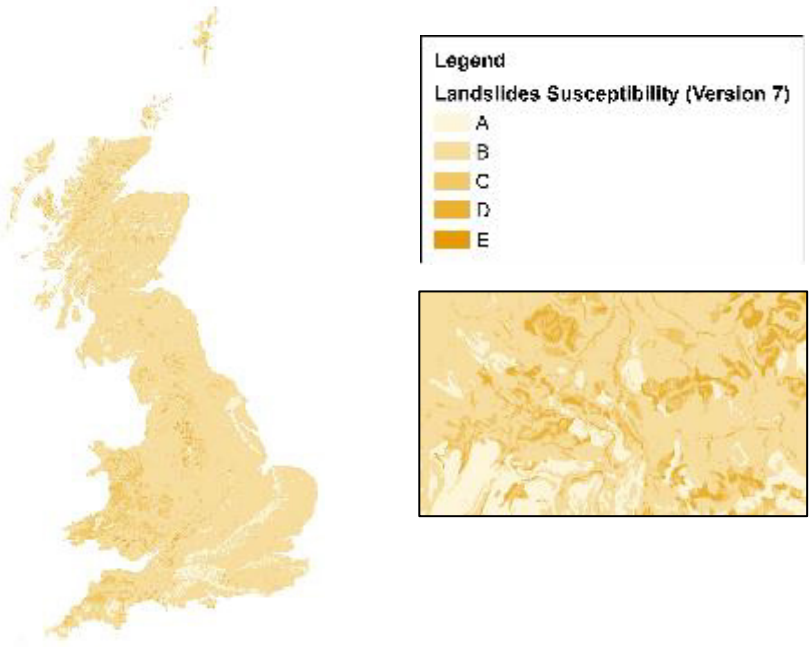
Landslides occur ultimately due to the effect of gravity, although other factors such as geology, topography, weathering, drainage and man-made construction can all contribute to the overall stability of a slope.

Landslides are commonly divided into four categories: falls, topples, slides or flows.

Landslides rarely comprise a single type of movement but are often the result of a combination of several types.

Whilst the BGS currently has over 17 000 landslides in its National Landslide Database many of these are ancient and occurred under different climatic conditions to those of the present day (e.g. Pleistocene). If left undisturbed these ancient mass movement deposits may remain stable for many years, however poorly planned development can sometimes reactivate these ancient slides.

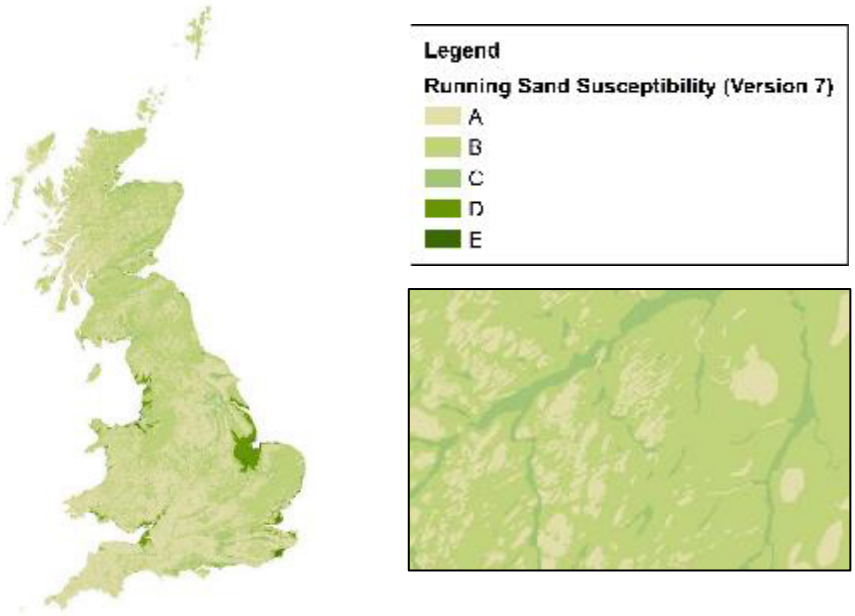
Downslope movement of materials through landsliding may damage buildings or infrastructure through loss of support or due to direct impact.



Running sand

Some rocks can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

Running sand hazards can occur where excavations in the sand go below the water table, where springs occur at the base of sand outcrops, around leaking drains or mains water supply pipes or in entire sand bodies if vibrated (liquefaction) e.g. by an earthquake.



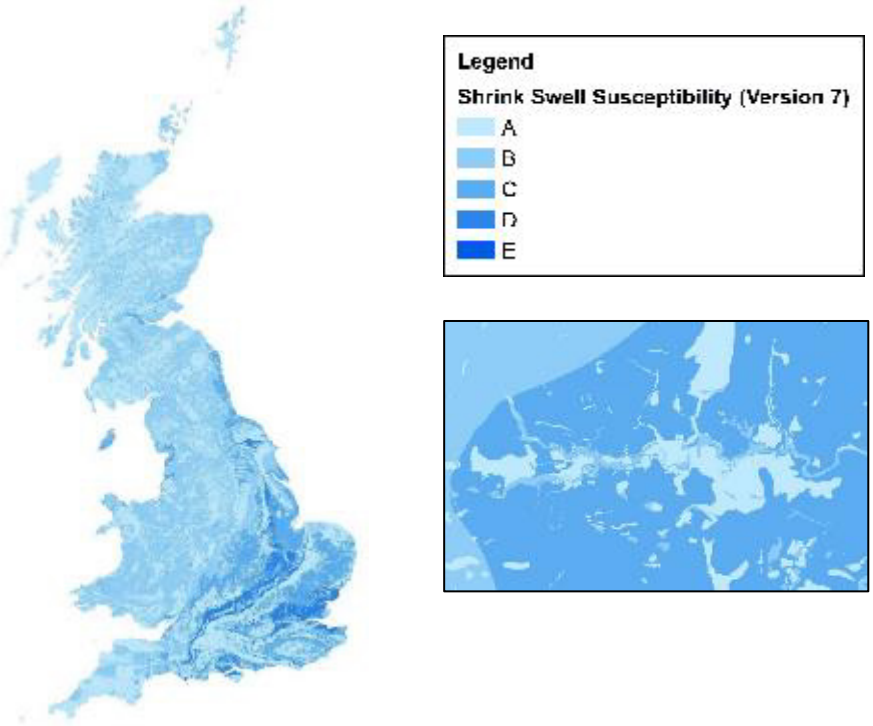
Shrink swell

Shrinking and swelling of the ground (often reported as subsidence) is one of the most damaging geohazards in Britain today, costing the economy an estimated £3 billion over the past decade.

Many soils contain clay minerals that absorb water when wet (making them swell), and lose water as they dry (making them shrink). Many of us see this in our gardens when the ground becomes cracked during the summer, yet becomes 'heavy' in the winter.

This shrink–swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

Ground moisture variations may be related to a number of factors, including weather variations, vegetation effects (particularly growth or removal of trees) and man-made activity. Variation in ground moisture can cause ground movement, particularly in the upper two metres of the ground which may affect building foundations, pipes or services.



Soluble rocks (dissolution)

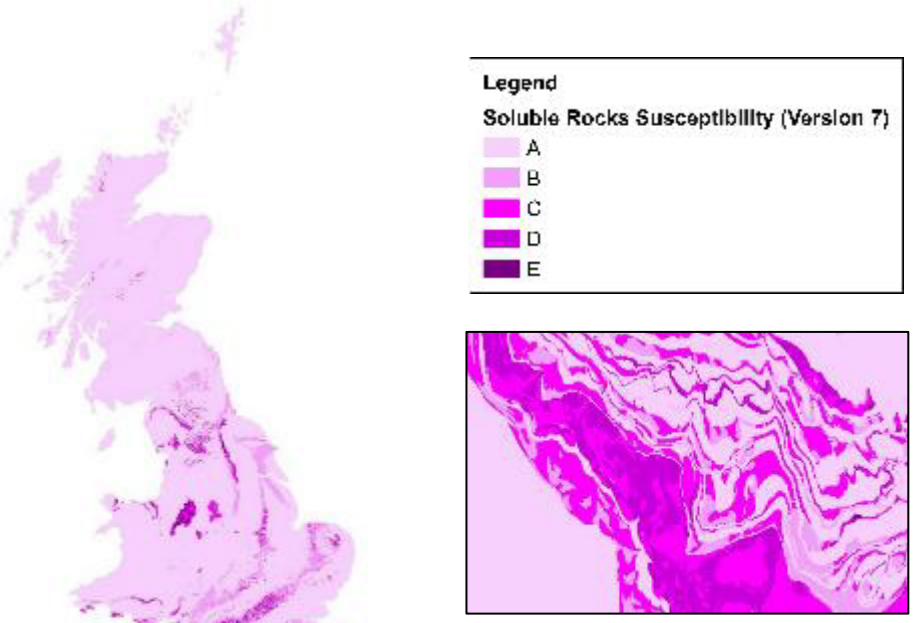
Ground dissolution occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

The three common rocks that dissolve are rock-salt, gypsum and limestone (including chalk). Dissolution of these rocks produces caves, sinkholes, sinking streams and large springs, creating a landscape known as karst.

Rock-salt is extremely soluble and has usually been removed from the near-surface zone by natural dissolution. Gypsum is highly soluble and can cause potential problems if it dissolved. Limestone is moderately soluble and is removed over a longer time-scale, but contains significant cavities.

Potential hazards associated with karst include near surface cavities, subsidence and sinkhole formation, uneven rockhead, reduced rock-mass strength, and rapid groundwater flow.

Although rare, cavities created by dissolution of soluble rocks can collapse, resulting in subsidence of the land above. More commonly, changes in ground or surface water flow can flush out existing sediment-filled fissures, sinkholes and caves, leading to subsidence. This causes the formation of circular cylindrical or conical depressions at the ground surface known variously as sinkholes, swallow holes, shake holes or dolines. However, with appropriate precautions, these hazards can usually be mitigated.



3.2. BGS GeoSure 5 km hex grid

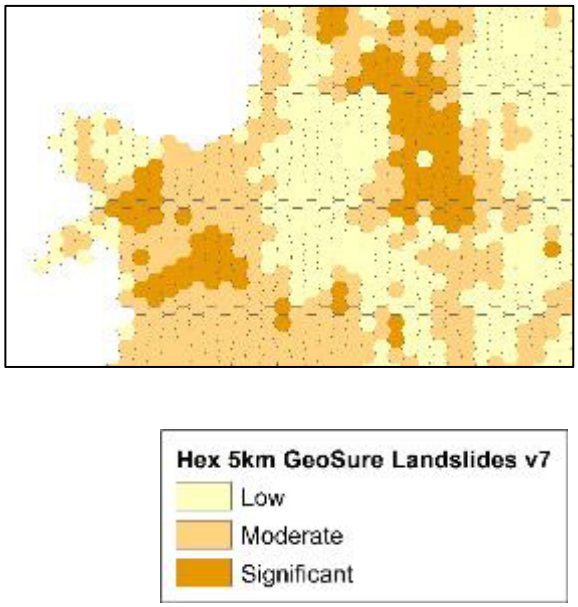
Scale	5 km hex grid (approx. 1:5 000 000)
Coverage	Great Britain
Format	GIS polygon data (ESRI)
Price	Free for commercial, research and public use under the Open Government Licence. Please aknowledge the material.

Website link https://www.bgs.ac.uk/products/geoSure/geoSureHex.html

The BGS GeoSure 5 km hex grid datasets provide a generalised overview of the susceptibility to six naturally occurring geohazards in Great Britain. The hexagon grid provides a national-scale summary of the GeoSure data product. The detailed GeoSure dataset is also available to licence and provides further detail at a scale of 1:50 000.

The 5 km hex grid data has been generalised into a vector map of interlocking hexagon cells (a side length of 5 km), with an area approximately 65 km^2. There are three classes included within the data: low, moderate and significant. The six layers of data provided are as follows:

- collapsible deposits
- compressible ground
- landslides (slope stability)
- running sand
- shrink–swell potential
- soluble rocks (dissolution)



Landslides

3.3. BGS GeoSure shrink-swell 3D for London and Thames

Scale	1:50 000
Coverage	London and Thames Valley
Format	GIS polygon data (ESRI, MapInfo, others available by request)
Price	On application; subject to number of users, licence fee and data preparation fee.

Website link https://www.bgs.ac.uk/products/geoSure/geoSureLondon.html

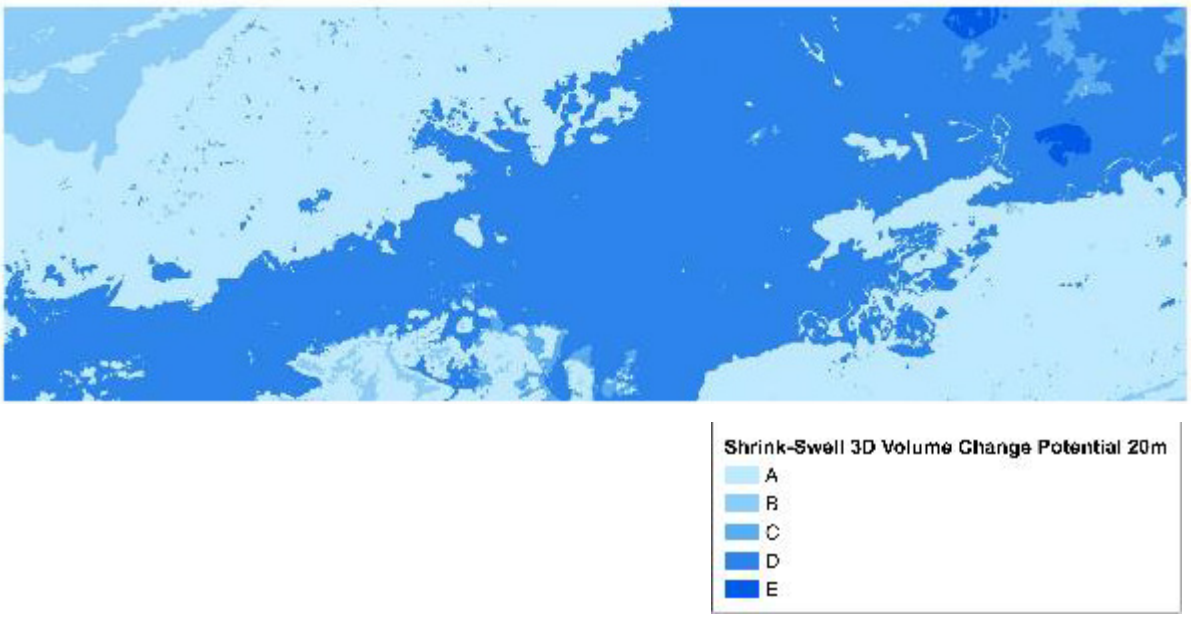
The shrink–swell 3D data is a regional hazard susceptibility map that identifies areas of potential shrink–swell hazard, in three dimensional space, at intervals down to 20 m in the London and Thames Valley area. The data is classified on an A–E range of hazard susceptibility.

Swelling clays can change volume due to variation in moisture, which can cause ground movement that may affect many foundations. Ground moisture variations may be related to a number of factors, including weather variations, vegetation effects (particularly growth or removal of trees) and the activities of people that might cause changes to the ground conditions. Such changes can affect building foundations, pipes or services.

These hazards may also impact on anyone involved in the construction of large structures (deep foundations, basements), infrastructure networks (road or rail) or utility companies. The 3D properties of these materials can be used to identify potential problems at surface, in the shallow subsurface or deeper underground (e.g. tunnels).

The data have been produced by geologists, geotechnical specialists and information developers at the BGS, and are derived from the London geological model.

BGS GeoSure shrink–swell 3D for London is part of the BGS GeoSure range of natural subsidence products.



3.4. BGS GeoSure debris flow

Scale 1:50 000

Coverage Great Britain

Format GIS polygon data (ESRI, MapInfo, others available by request)

Price Data now available for evaluation/beta testing.

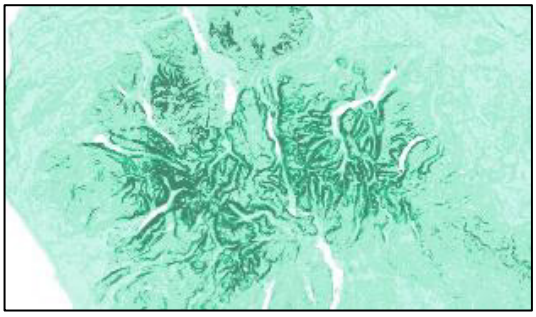
Website link https://www.bgs.ac.uk/products/geosure/geoSureDebrisFlow.html

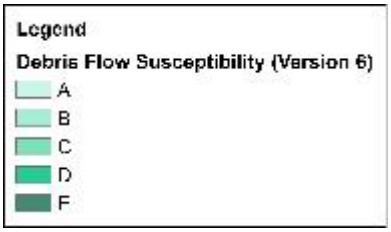
The debris flow landslide layer provides information on the potential of the ground, at a given location, to form a debris flow. It is based on a combination of digital geological, hydrogeological and topographic data. The methodology develops an additional dimension to the BGS GeoSure landslides layer and is designed for users interested specifically in debris flow susceptibility.

The term debris flow refers to the rapid, downslope flow of poorly sorted debris mixed with water. They are a widespread phenomenon in mountainous terrain and are distinct from other types of landslides as they can occur periodically on established paths, usually gullies and first- or second-order drainage channels. Debris flows in Great Britain are most commonly found in upland Scotland but also occur in parts of Wales and the Lake District.

Debris flows are potentially very destructive and, due to the speed at which they take place, can for example rapidly block infrastructure routes such as the Rest and Be Thankful Pass and Glen Ogle.

The BGS GeoSure debris flow landslides layer is part of the BGS GeoSure range of natural subsidence products.





3.5. BGS mining hazard (not including coal)

Scale 1:50 000

Coverage Great Britain

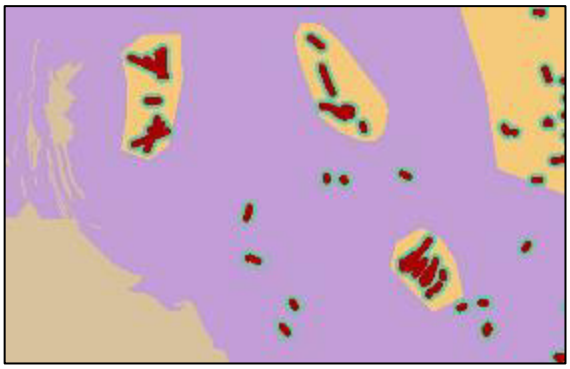
Format GIS polygon data (ESRI, MapInfo, others available by request)

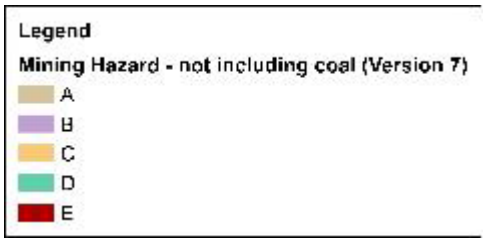
Price 30p per km^2. Subject to number of users, licence fee and data preparation fee.

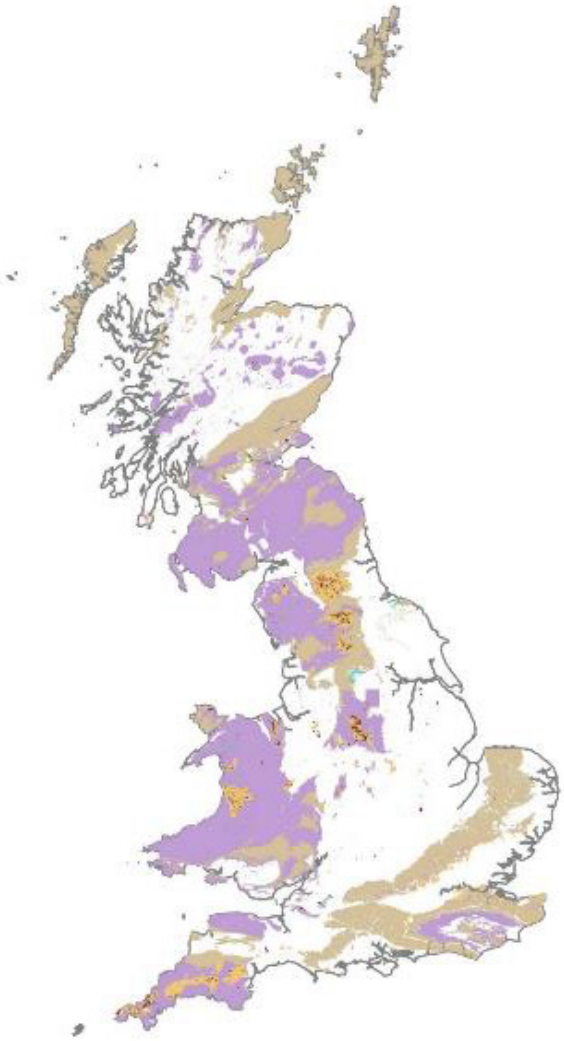
Website link https://www.bgs.ac.uk/products/geohazards/miningHazard/miningHazard.html

The BGS mining hazard (not including coal) dataset provides essential information for planners and developers building in areas of former shallow underground mine workings that may collapse. Mining hazards may lead to financial loss for anyone involved in the ownership or management of property, including developers, householders or local government. These costs could include increased insurance premiums, depressed house prices and, in some cases, engineering works to stabilise land or property. Armed with knowledge about potential hazards, preventative steps can be put in place to alleviate the impact of the hazard to people and property. The cost of such prevention may be very low, and is often many times lower than the repair bill following ground movement.

Mining of coal is specifically excluded from this dataset and enquiries on past coal mining should be directed to the Coal Authority.







3.6. BGS mining hazard (not including coal) 1 km hex grid

Scale	1 km hex grid (approx. 1:1 000 000)
Coverage	Great Britain
Format	GIS polygon data (ESRI)
Price	Free for commercial, research and public use under the Open Government Licence. Please acknowledge the material.

Website link https://www.bgs.ac.uk/products/geohazards/miningHazard/miningHazardHex.html

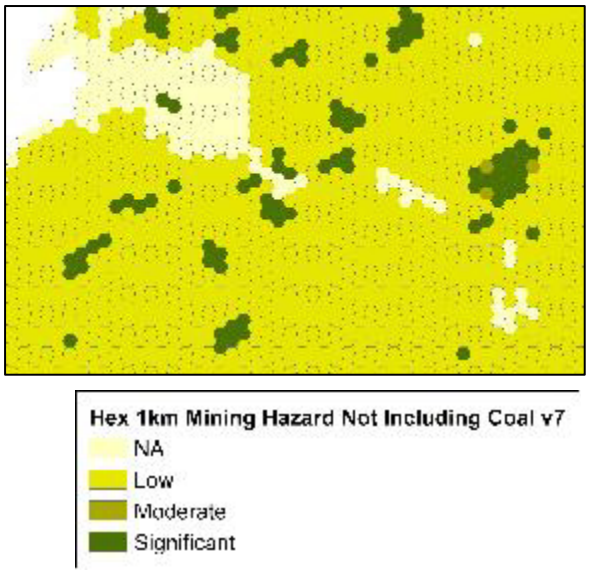
The BGS mining hazard (not including coal) 1 km hex grid dataset provides a generalised overview of the likelihood for mining to have occurred. It provides a national-scale summary of the presence of mining and an indication of the level of hazard associated with old workings.

The data has been generalised into a vector map of interlocking hexagon cells, side length 1 km, area approximately 2.6 km^2.

There are four classes included within the data:

- Low: localised, small-scale mining may have occurred in the area.
- Moderate: small scale, underground mining may have occurred in the area.
- Significant: underground mining is known or considered likely to have occurred in the area.
- NA: no record of activity.

The data has been generalised from the BGS mining hazard (not including coal) dataset. This additional detailed dataset is also available to licence and provides further detail as well as information on the type of commodity extracted, mine names, and any additional details where available, at a scale of 1:50 000.



3.9 Property Subsidence Assessment (PSA)

Scale	PSA Buildings: 1:50 000; PSA Postcodes
Coverage	England & Wales
Availability	Licensed
Format	PSA Buildings: GIS polygon data (ESRI, others available by request) PSA Postcode: Database csv tables
Price	On application
Uses	Local-level use

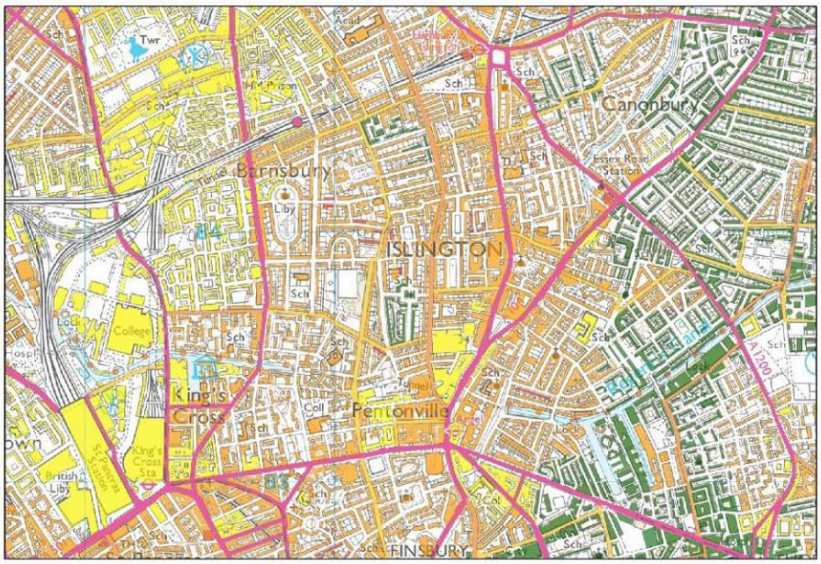
Website link https://www.bgs.ac.uk/datasets/property-subsidence-assessment/

Subsidence hazards as a result of shrink-swell clay soils, inadequate foundation structures, and tree presence/proximity, may lead to financial loss for anyone involved in the ownership or management of property, including developers, householders or local government. These costs could include increased insurance premiums, depressed house prices and, in some cases, require engineering works to stabilise land or property.

The BGS Property Subsidence Assessment dataset uses a combination of best available geology, tree location and property (including age, drainage, building type and number of storeys) information to provide property and postcode specific information on ground movement (predominately due to shrink–swell) across England and Wales.

The BGS Property Subsidence Assessment dataset identifies the risk of subsidence at property and postcode resolutions. There are two levels of data:

- BGS Property Subsidence Assessment Buildings: Building level vector GIS data, built on OS Open Map Local, providing individual risk scores for geology, tree density, age of building, potential drainage failure associated with the building, number of storeys, and building type, and a combined hazard score,
- BGS Property Subsidence Assessment Postcodes: Postcode level data, delivered as a csv table, providing a combined hazard score for each postcode.



BGS Property Subsidence Assessment – buildings sample. BGS © UKRI. Contains Ordnance Survey data © Crown Copyright and database rights 2020. Ordnance Survey Licence No. 100021290 EUL).

4. Geochemistry datasets

4.1. BGS radon potential

Scale 1:50 000

Coverage Great Britain

Format GIS polygon data (ESRI, MapInfo, others available by request)

Price 30p per km^2. Subject to number of users, licence fee and data preparation fee.

Map viewer http://mapapps2.bgs.ac.uk/geoindex/home.html

WMS https://map.bgs.ac.uk/arcgis/services/GeoIndex_Onshore/radon/MapServer/WmsServer

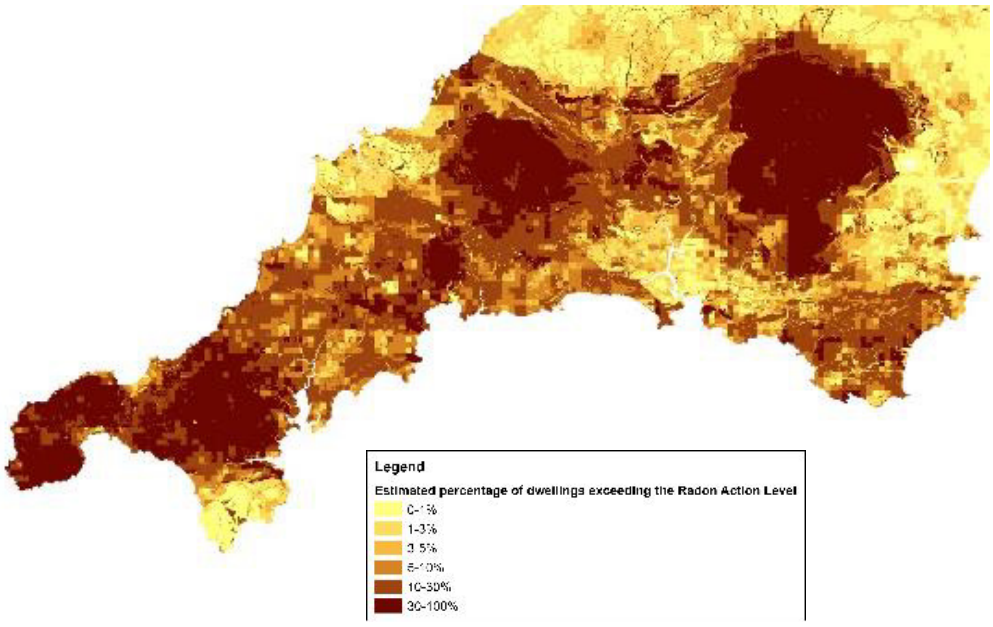
Website link https://www.bgs.ac.uk/radon/indicativeRadonDataset.html

The radon potential dataset is the definitive map of Radon Affected Areas in England and Wales, created jointly by the Health Protection Agency (HPA) and the BGS using long-term radon measurements made in over 460 000 homes across England and Wales (without affecting householders' confidentiality), combined with geological mapping. The dataset includes a built in 75 m 'buffer', made up of 50 m to allow for the margin of error in the geological lines, and 25 m to represent the average extent of a home (in order to allow for when an Ordnance Survey ADDRESS-POINT® grid reference point is used to locate a home).

The HPA recommends that radon levels should be reduced in homes where the annual average is at or above 200 becquerels per cubic metre (200 Bq m-3). This is termed the Action Level. The HPA defines Radon Affected Areas as those with 1% chance or more of a house having a radon concentration at or above the Action Level of 200 Bq m-3.

The Radon Potential dataset answers the following questions:

- Is a property in a Radon Affected Area?
- What level of Radon Protective Measures do I need to install if I am building a new building or an extension to an existing building?



4.2. BGS Soil chemistry for environmental assessment

Scale	1:50 000
Coverage	Great Britain
Format	GIS point and polygon data (ESRI, MapInfo, others available by request)
Price	£1.20p per km^2 for all 5 elements. 30p per km^2 for single elements. Subject to number of users, licence fee and data preparation fee.

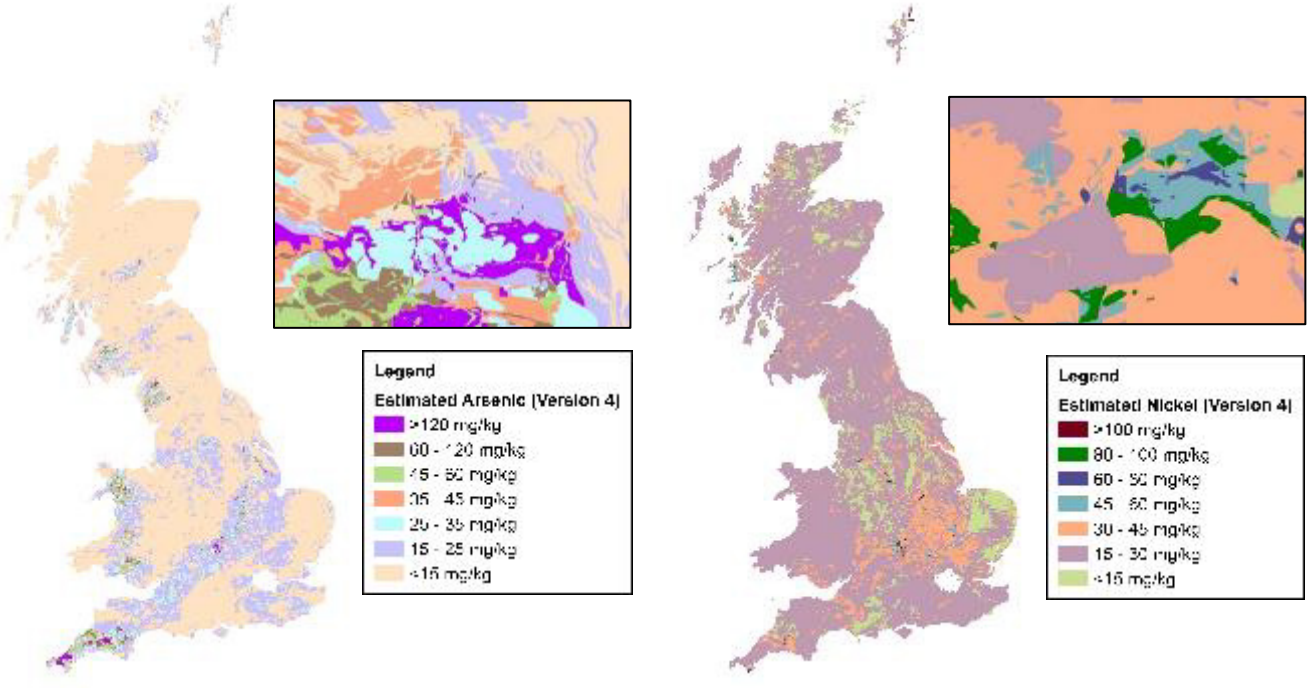
Website link https://www.bgs.ac.uk/products/geochemistry/nationalSoilChemistry.html

The BGS soil chemistry for environmental assessments dataset coverage dataset, developed from BGS G-BASE and Imperial College Wolfson Atlas data, contains estimated ambient As, Cd, Cr, Ni and Pb background concentrations for rural topsoils across Great Britain. It also contains the locations and measured concentrations (mg kg^{-1}) of As, Cd, Cr, Cu, Ni, Pb, Sn and Zn in urban topsoil samples, collected from geochemical surveys in 23 major urban centres.

The dataset comprises of the following layers:

Estimated ambient background soil chemistry (1:50 000)

The estimated values provide the likely background concentration of the potentially harmful elements As, Cd, Cr, Ni and Pb in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 km^2. In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 km^2; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

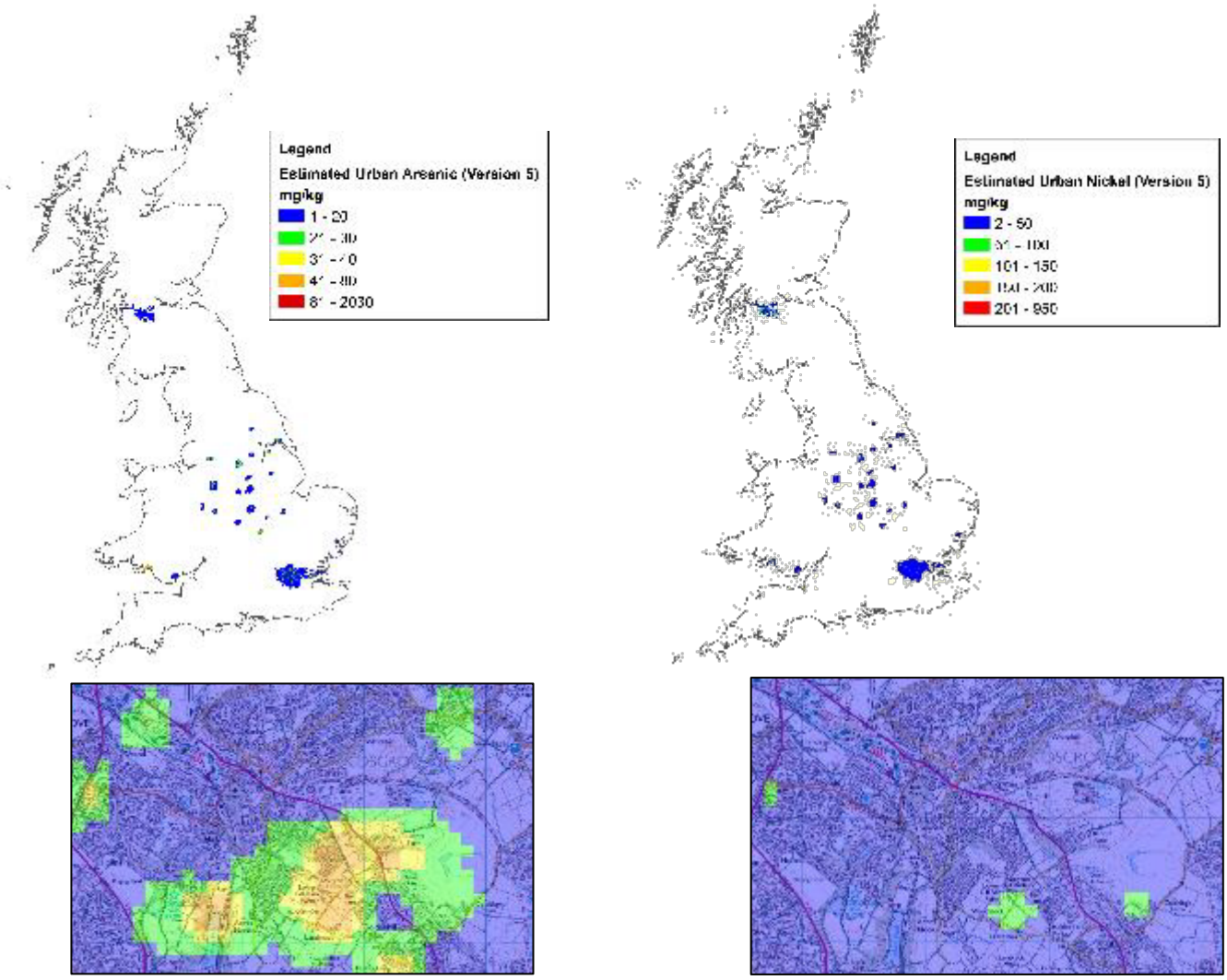


Measured urban soil dataset

The locations and measured total concentrations (mg kg^{-1}) of As, Cd, Cr, Cu, Ni, Pb, Sn and Zn in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per km^2.

Estimated urban soil chemistry (1:10 000)

Estimated topsoil chemistry of As, Cd, Cr, Cu, Ni, Pb, Sn and Zn and bioaccessible As and Pb in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per km^2). The estimates are calculated in two ways:



4.3. G-BASE for the UK

Scale	N/A
Coverage	Partial Great Britain coverage
Format	Ascii grid data (500m cell size). Printable map in png format. Database tables for survey points
Price	Free grid data available under the Open Government Licence. Please acknowledge the material. Survey point data available under licence on request.

Website link https://www.bgs.ac.uk/products/geochemistry/GbaseUK.html

The Geochemical Baseline Survey of the Environment (G-BASE) project sets out to map and establish the natural geochemical baseline of the British Isles by collecting stream sediment, water, soil and more recently vegetation samples (at drainage sites) throughout the UK.

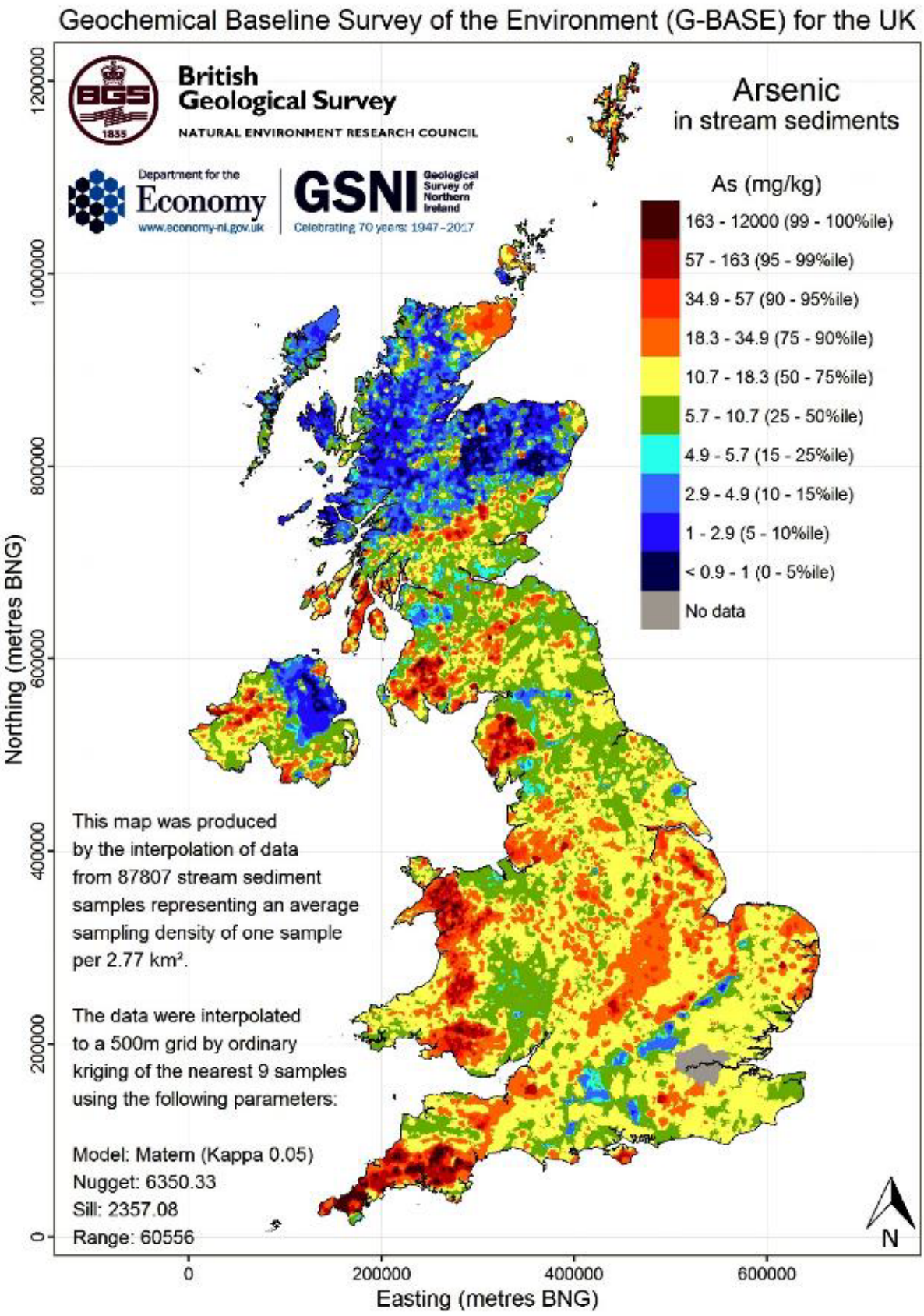
The regional geochemical baseline datasets are important in order to understand our environment and to measure changes, whether they be natural or human-made. This baseline dataset of the surface environment also allows us to model the migration of elements and provides a reference point against which we can monitor change.

The geochemical baseline stream sediment maps for the UK present data compiled from the BGS's G-BASE project and the Geological Survey of Northern Ireland's TellusNI geochemical survey. The maps are based on analyses of the <150 μm size fraction of up to 110 794 sediment samples collected from first and second order (i.e. small) streams across the UK, that have been analysed for up to 52 major and trace elements (e.g. calcium, magnesium, cobalt, nickel etc). An atlas of the element stream-sediment concentrations for the north of Ireland is available online for viewing as an ebook download.

For the rest of the UK, more detailed information on the G-BASE stream-sediment dataset, including a series of regional geochemical atlases, is available to download.

The dataset for 18 elements can be downloaded as a set of interpolated concentration maps (37.4 MB) on a 500 m grid across the UK.

Survey dataset from the G-BASE project is also available under licence.


Geochemical Baseline Survey of the Environment (G-BASE) for the UK
British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL
Department for the Economy
www.economy-ni.gov.uk
GSNI Geological Survey of Northern Ireland
Celebrating 70 years: 1947–2017
Arsenic
in stream sediments
As (mg/kg)
163 - 12000 (99 - 100%ile)
57 - 163 (95 - 99%ile)
34.9 - 57 (90 - 95%ile)
18.3 - 34.9 (75 - 90%ile)
10.7 - 18.3 (50 - 75%ile)
5.7 - 10.7 (25 - 50%ile)
4.9 - 5.7 (15 - 25%ile)
2.9 - 4.9 (10 - 15%ile)
1 - 2.9 (5 - 10%ile)
< 0.9 - 1 (0 - 5%ile)
No data
This map was produced by the interpolation of data from 87807 stream sediment samples representing an average sampling density of one sample per 2.77 km².
The data were interpolated to a 500m grid by ordinary kriging of the nearest 9 samples using the following parameters:
Model: Matern (Kappa 0.05)
Nugget: 6350.33
Sill: 2357.08
Range: 60556
N
Northing (metres BNG)
0
200000
400000
600000
800000
1000000
1200000
Easting (metres BNG)
0
200000
400000
600000

4.4. London Earth

Scale N/A

Coverage Greater London Area

Format Excel or GIS point format (ESRI, MapInfo, others available by request)

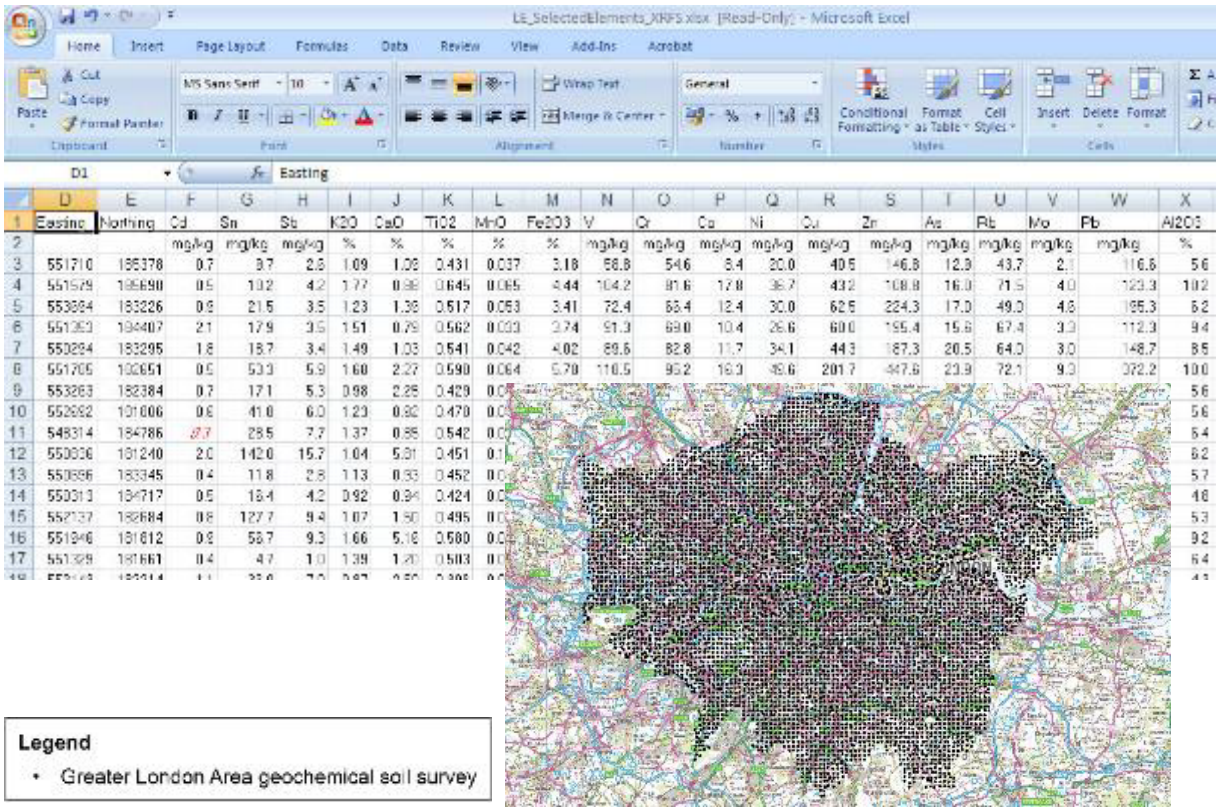
Price Free. Subject to number of users, licence fee and data preparation fee

Map viewer http://mapapps.bgs.ac.uk/londonearth/londonearth.html

Website link https://www.bgs.ac.uk/products/geochemistry/londonEarth.html

The resource includes data from the London Earth geochemical survey of Greater London and the surrounding areas. As part of the London Earth project, 6600 soil samples, typically taken from open ground such as parks, playing fields, gardens and roadside verges, were collected across Greater London during 2008 and 2009. The samples were then analysed for concentrations of over 50 different chemical elements, including potentially harmful elements such as arsenic, lead and nickel. The data provide unique information on soil chemistry in the urban environment, which will be of direct relevance to land-use planning and development, urban regeneration and contaminated-land assessment.

The London Earth data are a subset of the results of the G-BASE survey. Through this survey, the BGS provides national capability in quantifying the geochemical variation of the shallow subsurface, including the soils beneath our cities. Comparison of the soil data from London with those from adjacent rural areas will allow identification of impacts on the environment brought about by urbanisation and industrial activities.



5. Hydrological datasets

5.1. Aquifer designation data

Scale 1:50 000

Coverage England

Format GIS polygon data (ESRI, MapInfo, others available by request)

Price 30p per km^2. Subject to number of users, licence fee and data preparation fee.

Website link https://www.bgs.ac.uk/products/hydrogeology/aquiferDesignation.html

The aquifer designation dataset has been created by the Environment Agency and British Geological Survey and identifies the different aquifers of England.

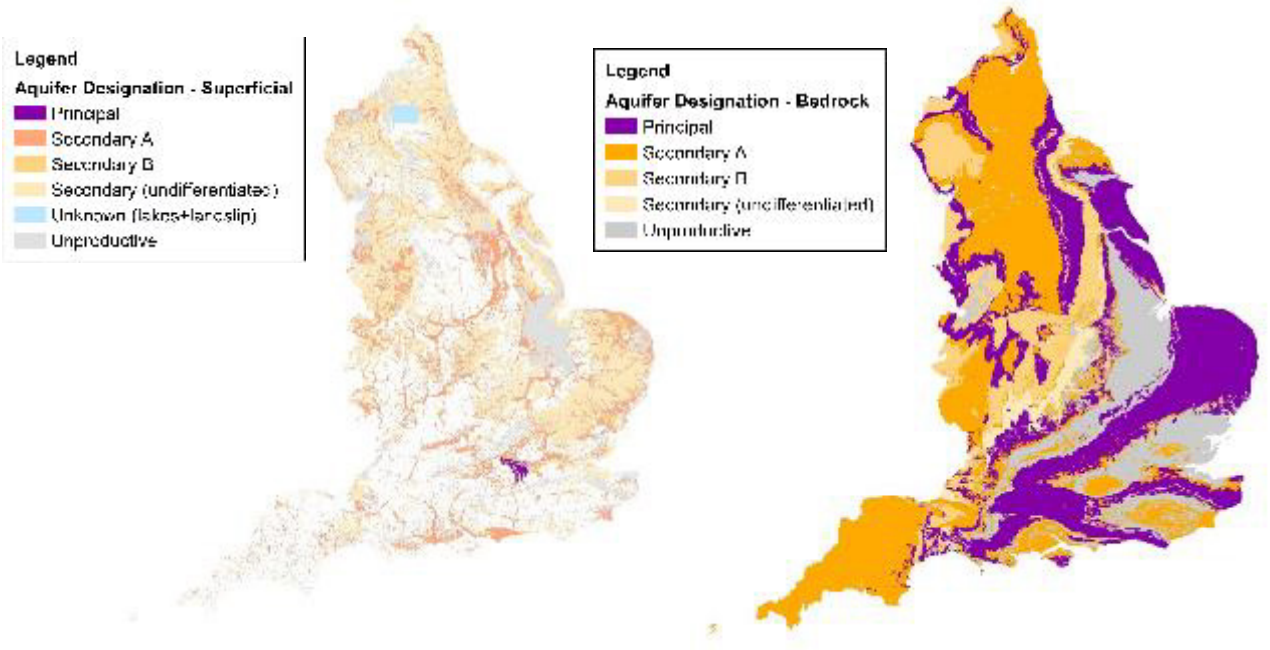
From 1 April 2010, the Environment Agency's Groundwater Protection Policy will be using aquifer designations that are consistent with the Water Framework Directive. These designations reflect the importance of aquifers in terms of groundwater as a resource (drinking water supply) but also their role in supporting surface water flows and wetland ecosystems.

The maps are split into two different type of aquifer designation:

- Superficial (drift) — permeable unconsolidated (loose) deposits. For example, sands and gravels
- Bedrock — solid permeable formations e.g. sandstone, chalk and limestone

The maps display the following aquifer designations:

- Principal aquifers
- Secondary aquifers (further subdivided into Secondary A, Secondary B, and Secondary Undifferentiated)
- Unproductive strata



5.2. BGS Geological Indicators of Flooding (GIF)

Scale 1:50 000

Coverage Great Britain

Format GIS polygon data (ESRI, MapInfo, others available by request)

Price 30p per km^2 Subject to number of users, licence fee and data preparation fee.

Website link https://www.bgs.ac.uk/products/hydrogeology/indicatorsOfFlooding.html

Geological maps show where all the floodplains and coastal plains in Britain are located and therefore the main areas at greatest risk of flooding; from this information BGS has produced the geological indicators of flooding dataset.

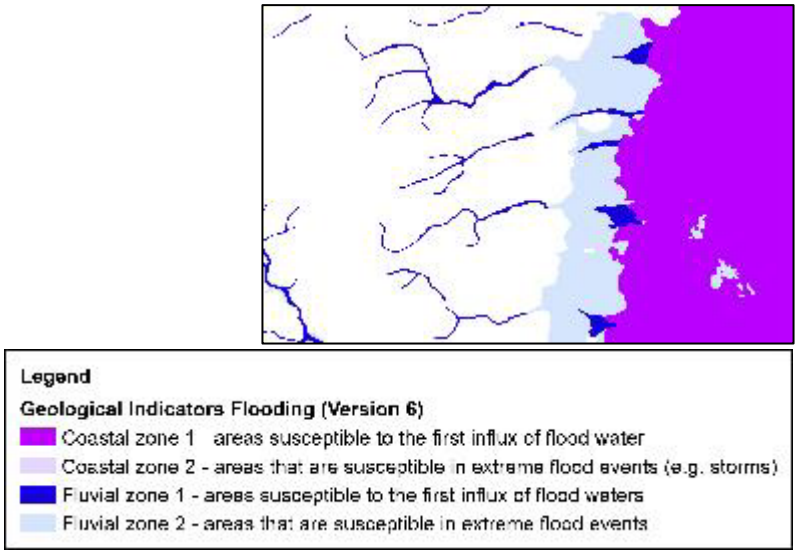
The map shows areas vulnerable to two main types of flooding — inland (river floodplains) and coastal/estuarine.

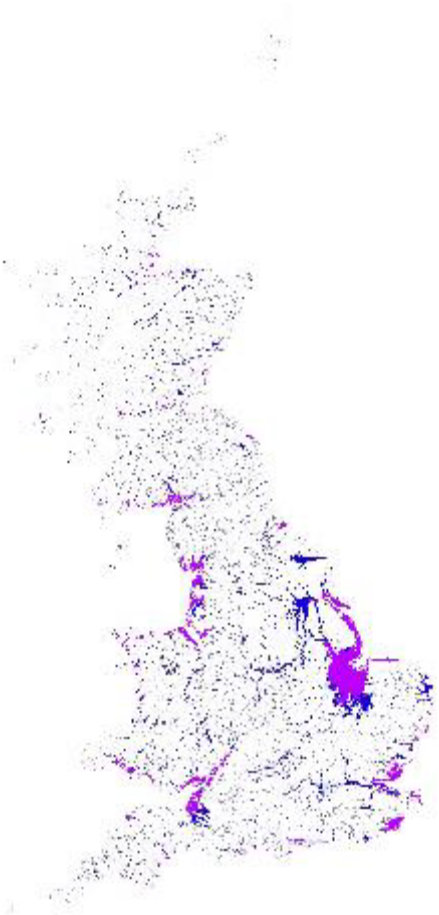
Inland flood plains are the flattish areas near to the river where mud, sand and gravel were deposited by previous floods.

On geological maps these materials are commonly known as 'alluvium', but they can also include lake deposits, and river terraces.

For coastal plains a range of marine deposits, for example tidal flats, define areas where the sea has formerly occupied the land.

The map is based on observation of the types of geological deposit present and does not take into account any man-made influences such as house building or flood protection schemes. It also doesn't take into account low-lying areas where flooding could occur but where there are no materials indicating flooding in the geological past.The BGS Geological indicators of flooding data should be regarded as complementary to, and not a replacement for, existing flood risk maps such as those provided by the Environment Agency.





5.3. BGS groundwater flooding

Scale 1:50 000

Coverage Great Britain

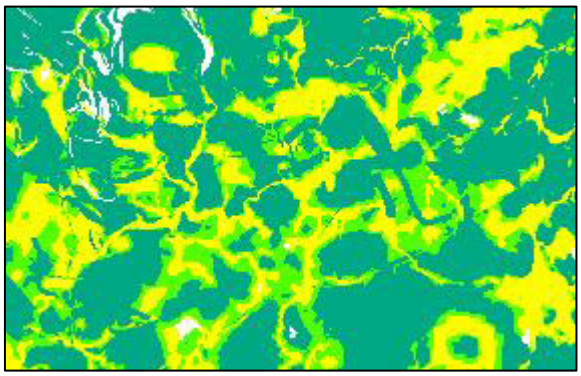
Format GIS polygon data (ESRI, MapInfo, others available by request)

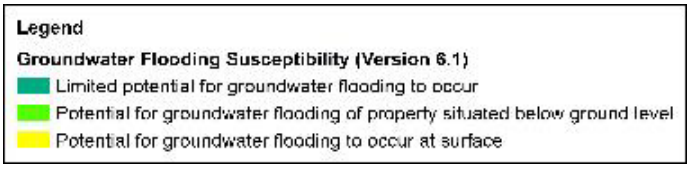
Price 30p per km^2. Subject to number of users, licence fee and data preparation fee.

Website link https://www.bgs.ac.uk/products/hydrogeology/groundwaterFlooding.html

In response to the need for more information on groundwater flooding, BGS has produced the first national dataset on the susceptibility of groundwater flooding, covering England, Wales and Scotland. Based on geological and hydrogeological information, the digital data can be used to identify areas where geological conditions could enable groundwater flooding to occur and where groundwater may come close to the ground surface.

Groundwater flooding is the emergence of groundwater at the ground surface. It can occur in a variety of geological settings including valleys in areas underlain by chalk, and in river valleys with thick deposits of alluvium and river gravels. Groundwater flooding happens in response to a combination of already high groundwater levels (usually during mid or late winter) and intense or unusually lengthy storm events. Groundwater flooding often lasts much longer than flooding caused by a river overflowing its banks. It may last many months and can cause significant social and economic disruption to the affected areas.





5.4. BGS depth to groundwater

Scale 1:50 000

Coverage Great Britain

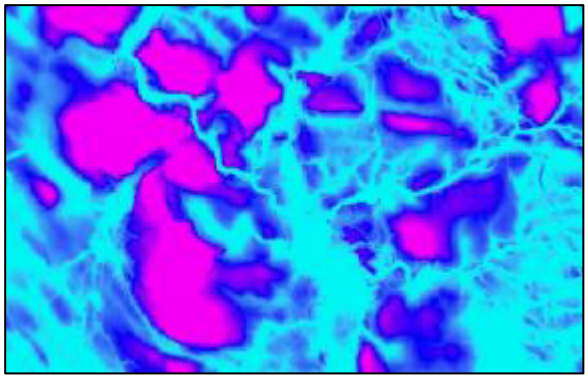
Format GIS raster data (ESRI grid, ASCII grid, others available by request)

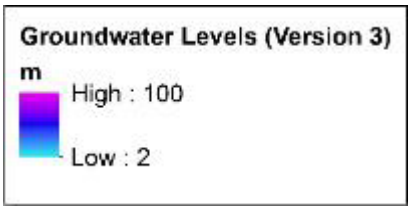
Price 15p per km^2. Subject to number of users, licence fee and data preparation fee.

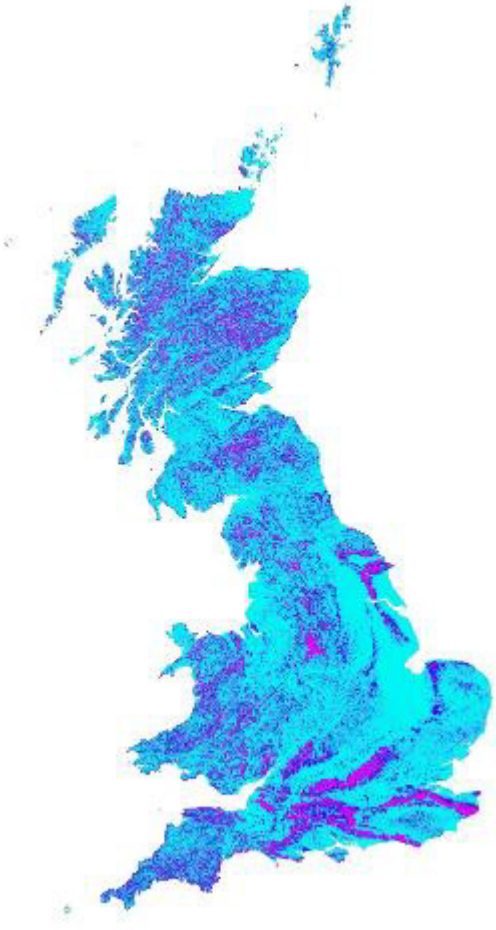
Website link https://www.bgs.ac.uk/products/hydrogeology/depthToGroundwater.html

The BGS depth to groundwater dataset is a gridded interpolation of depth to groundwater. The dataset is a raster grid, with 50 × 50 metre pixels holding values that represent the probable maximum depth, in metres, to the phreatic water table. This represents the likely lowest water level, under natural conditions, in an open well or borehole drilled into the uppermost parts of a rock unit. The dataset has been modelled from topography and hydrology, assuming that surface water and groundwater are hydraulically connected. It has not used observations of groundwater level in wells or boreholes directly, but they have been used to validate its performance.

Groundwater plays a key role in many shallow geological processes, and an estimate of the level of the water table is an important component of site investigations, assessments of water resources and environmental studies. Data on groundwater level is frequently used as a component within geological models, for instance in studies of slope stability, groundwater flood susceptibility or the suitability of an area for sustainable urban drainage systems.







5.5. EA groundwater vulnerability (including BGS data)

Scale	1:50 000
Coverage	England
Format	GIS polygon data (ESRI, MapInfo, others available by request)
Price	40p per km^2 for commercial use, available from the BGS (subject to number of users, licence fee and data preparation fee). Free for non-commercial research and academic use; available from the Environment Agency.

Website link https://www.bgs.ac.uk/products/hydrogeology/GroundwaterVulnerability.html

The groundwater vulnerability maps have been created by the Environment Agency (EA) using data from the BGS, the Centre for Ecology & Hydrology and the National Soil Resources Institute. The maps provide an assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one kilometre square grid.

For the first time, the maps provide a separate assessment of the vulnerability of groundwater in overlying superficial rocks, and those that comprise the underlying bedrock. The maps also reflect improvements in data mapping and understanding of the factors affecting vulnerability and will replace the old map for groundwater protection purposes.

The groundwater vulnerability for each aquifer type is expressed as follows.

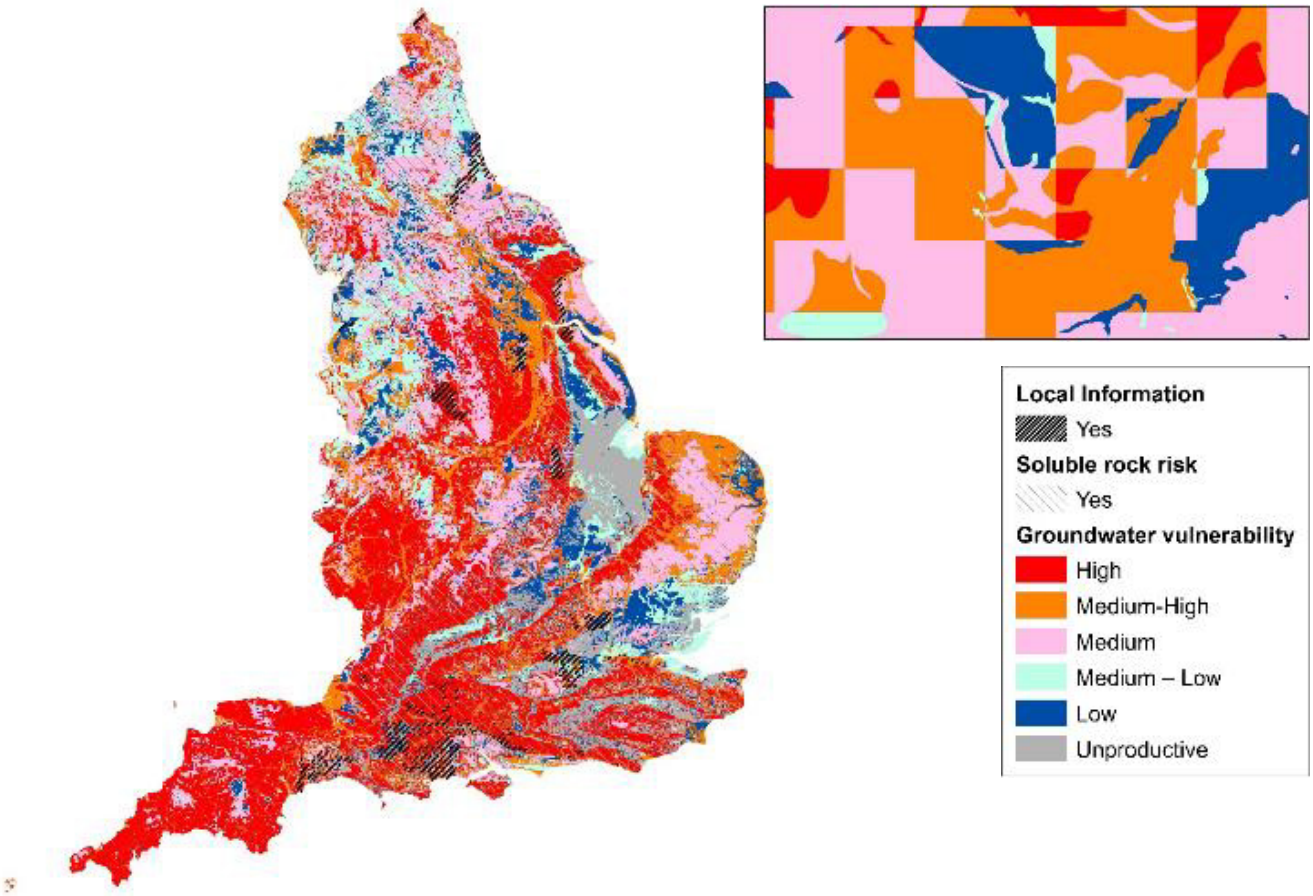
- High: areas able to easily transmit pollution to groundwater. They are characterised by high leaching soils and the absence of low-permeability superficial deposits.
- Medium: areas that offer some groundwater protection. Intermediate between high and low vulnerability.
- Low: areas that provide the greatest protection to groundwater from pollution. They are likely to be characterised by low leaching soils and/or the presence of low-permeability superficial deposits.
- Unproductive: areas comprised of rocks that have negligible significance for water supply or baseflow to rivers, lakes and wetlands. They consist of bedrock or superficial deposits with a low permeability that naturally offer protection to any aquifers that may be present beneath.

Combined groundwater vulnerability map

This product is intended for use by groundwater technical specialists due to the complex nature of the legend, which displays groundwater vulnerability (high, medium, low), the type of aquifer (bedrock, superficial, unproductive) and aquifer designation (principal, secondary, unproductive). These maps require that users are able to understand the vulnerability assessment method and interpret the individual components of the legend.

Simplified groundwater vulnerability map

This is designed for non-specialists who need to know the overall risk to groundwater from a particular activity, development or pollution incident, but do not have extensive hydrogeological knowledge. The map has five risk categories (high, medium-high, medium, medium-low and low) based on the likelihood of a pollutant reaching the groundwater (i.e. vulnerability), the type of aquifers present and the potential impact (i.e. the aquifer designation).


Local Information
Yes
Soluble rock risk
Yes
Groundwater vulnerability
High
Medium-High
Medium
Medium – Low
Low
Unproductive

5.6. BGS Hydrogeological maps of Scotland

Scale 1:100 000

Coverage Scotland

Format GIS polygon data (ESRI, MapInfo, others available by request)

Price 30p per km^2. Subject to number of users, licence fee and data preparation fee.

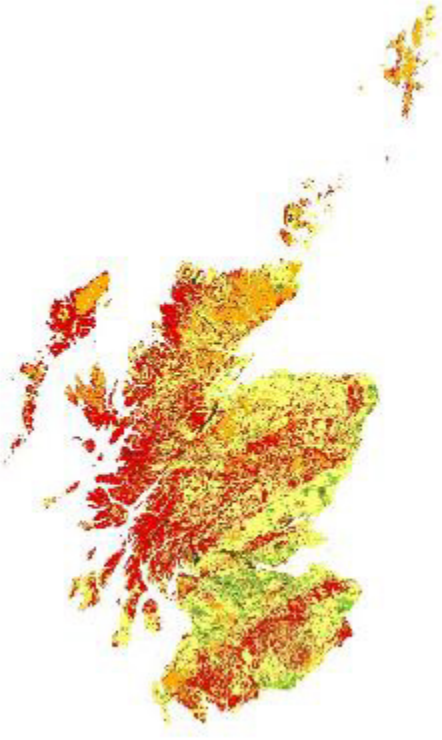
Website link https://www.bgs.ac.uk/products/hydrogeology/HydrogeologicalMapsScotland.html

BGS has produced a suite of hydrogeological maps of Scotland. These comprise the following layers:

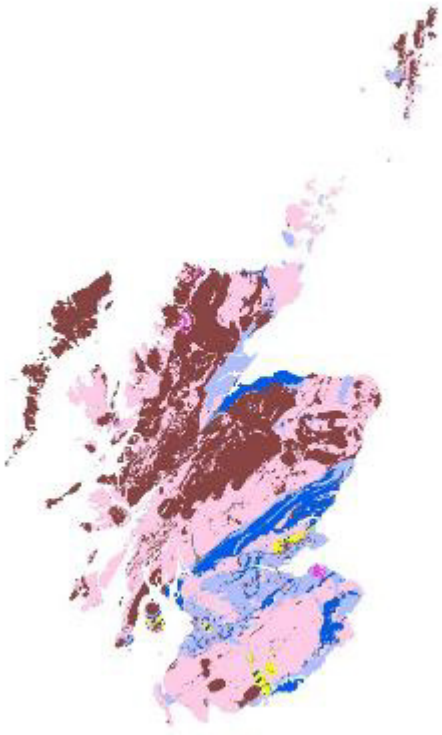
- groundwater vulnerability
- aquifer productivity (bedrock and superficial)

The groundwater vulnerability map shows the relative vulnerability of groundwater at the uppermost water table to contamination. Groundwater vulnerability is the tendency and likelihood for general contaminants to move vertically through the unsaturated zone and reach the water table after introduction at the ground surface.

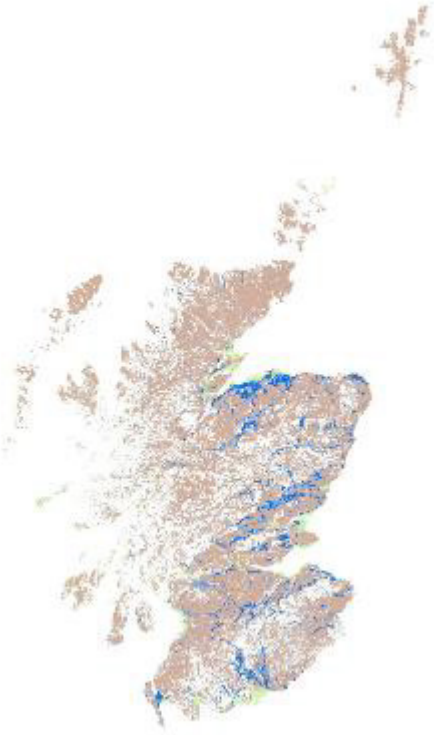
The aquifer productivity maps describe the potential of bedrock and superficial deposits aquifers across Scotland to sustain various levels of borehole water supply, and the dominant groundwater flow type in each aquifer. They have been used to help characterise groundwater bodies as required by the Water Framework Directive, and are also useful in policy development to prioritise water supply and site investigations, to inform planning decisions, and to improve awareness of groundwater in general.



Groundwater vulnerability



Aquifer productivity (bedrock deposits)



Aquifer productivity (superficial deposits)

5.7. BGS Permeability

Scale 1:50 000

Coverage Great Britain

Format GIS polygon data (ESRI, MapInfo, others available by request)

Price 10p per km^2. Subject to number of users, licence fee and data preparation fee.

Website link https://www.bgs.ac.uk/products/hydrogeology/permeability.html

The term permeability refers to whether and how water can flow through a rock. Permeability dataset is often used in studies of groundwater and in particular during investigations of pollution or aquifer contamination.

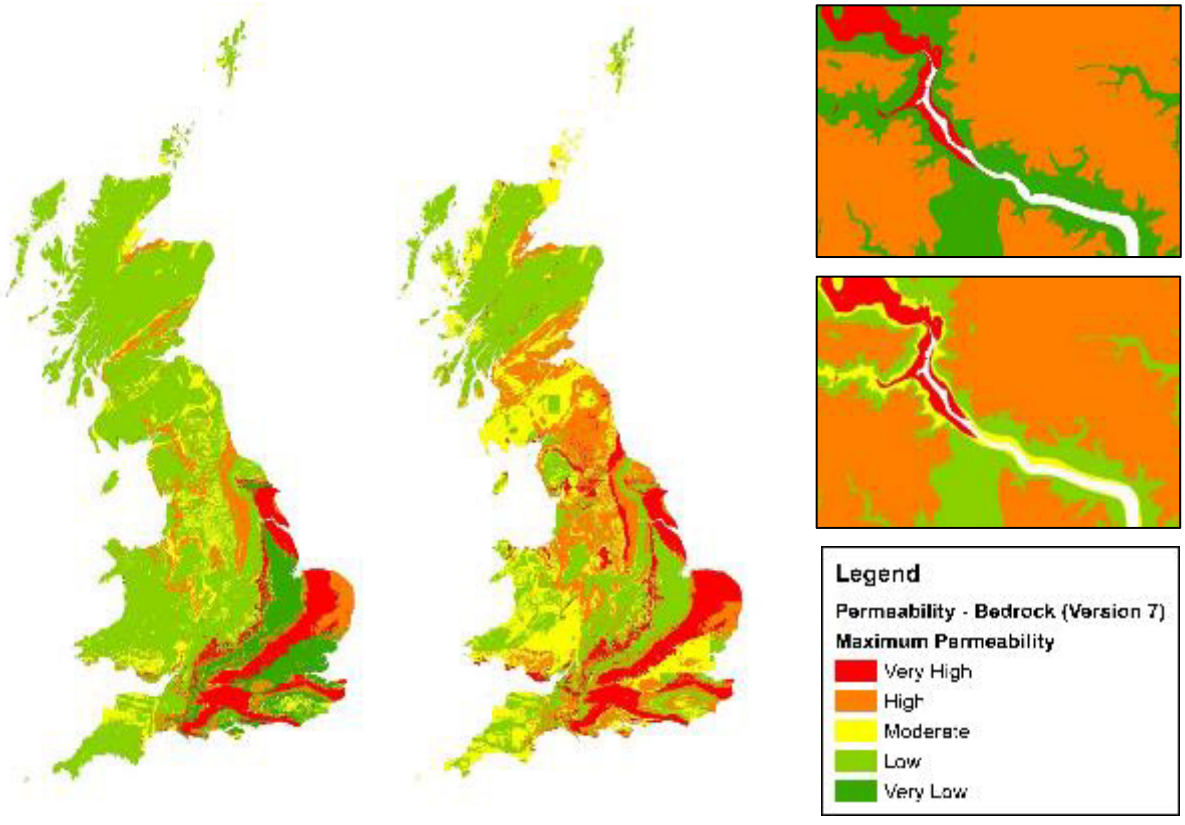
The BGS has prepared permeability information based on the 1:50 000 Digital Geological Map of Great Britain (BGS Geology 50k).

The permeability indices are based on geological considerations and are as follows:

- the predominant flow mechanism, either intergranular flow, fracture flow, or a mixture of intergranular and fracture flow
- a maximum permeability index
- a minimum permeability index

The permeability indices indicate the range of permeability likely to be encountered for each BGS Geology unit.

The maximum and minimum permeability indices are divided into five classes: very high, high, moderate, low, and very low permeability.



5.8. BGS Infiltration SuDS maps

Scale	1:50 000
Coverage	Great Britain
Format	GIS polygon data (ESRI, MapInfo, others available by request)
Price	Infiltration SuDS map: **detailed** - £1.50 per km^2 Infiltration SuDS map: **summary** - £0.50 per km^2 Both are subject to number of users, licence fee and data preparation fee.

This dataset is suitable for those involved in the planning and design of sustainable drainage systems (SuDS) and for those who approve SuDS planning applications within local authorities.

The dataset gives a preliminary indication of the suitability of the ground for infiltration SuDS. These are drainage systems that allow surface water to infiltrate to the ground, such as soakaways, infiltration basins, infiltration trenches and permeable pavements. The selection and design of an appropriate system depends on the properties of the ground and in particular the following four factors:

1. the presence of severe constraints that must be considered prior to planning infiltration
2. the drainage potential of the ground
3. the potential for ground instability when water is infiltrated
4. the protection of groundwater quality

Summary: Infiltration SuDS map

The summary map comprises four summary layers, providing an indication of the suitability of the ground for infiltration SuDS. The layers summarise: the presence of severe constraints; the drainage potential of the ground; the potential for ground instability as a result of infiltration and the susceptibility of the groundwater to contamination.

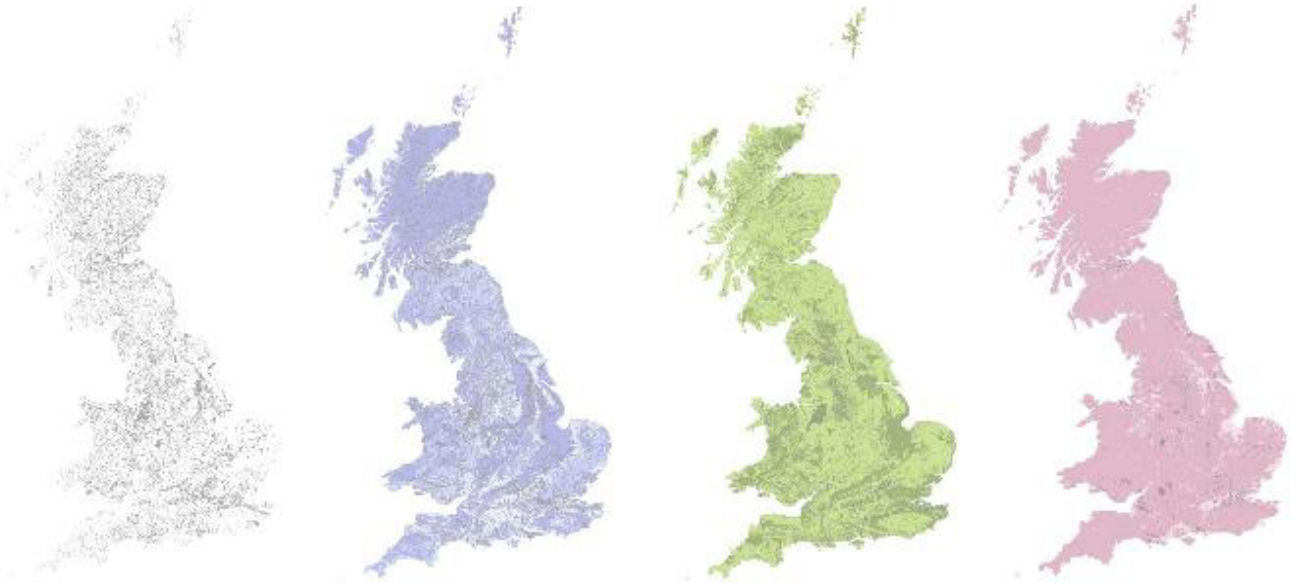
This map is anticipated to be of use in strategic planning and not for local assessment. It does not provide specific subsurface dataset or state the limitations of the subsurface with respect to infiltration.

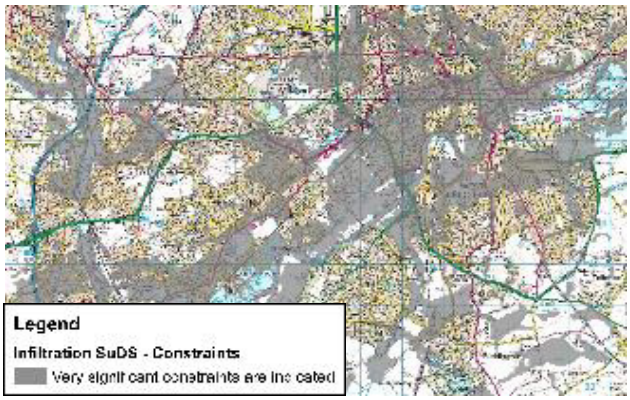
Detailed: Infiltration SuDS map

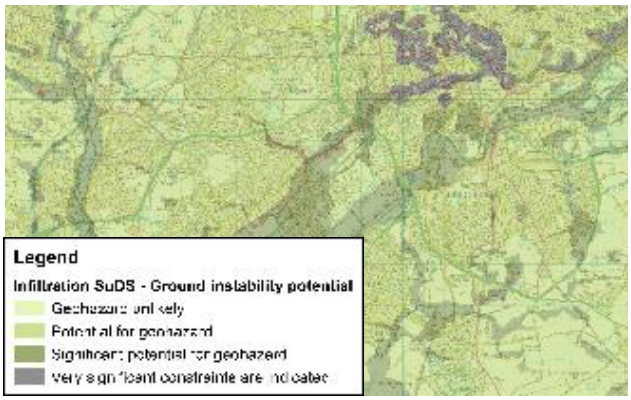
The detailed map provides the data layers described above, along with a further 20 individual, bespoke data layers. These data layers provide information on the properties of the ground, which can be used to guide local SuDS planning and design.

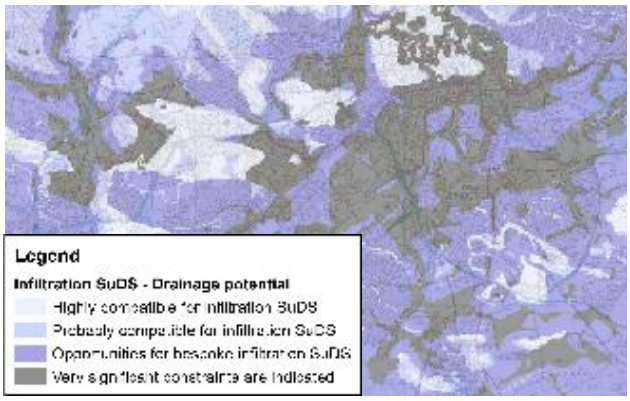
The dataset can be used to determine the likely limitations present at a site and make preliminary decisions on the type of infiltration SuDS that may be appropriate. We anticipate that this map will be used by planners, developers, consultants and SuDS Approval Bodies.

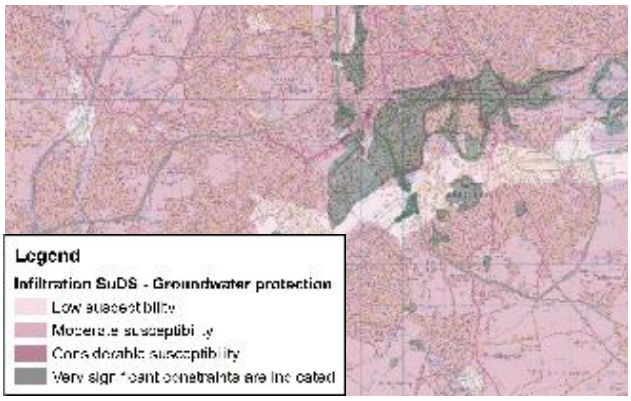
The dataset is intended to be used at a preliminary stage and is not a replacement for a site investigation.











5.9 BGS GeoScour Premium & Open

Scale	Tier 1: 1:625 000 Tier 2: 1:250 000 Tier 3: 1:50 000
Coverage	Great Britain
Format	GIS polygon data. (ESRI, MapInfo, other available by request)
Price	**Premium:** on request; Open: Free for commercial, research and public use under the Open Government Licence.

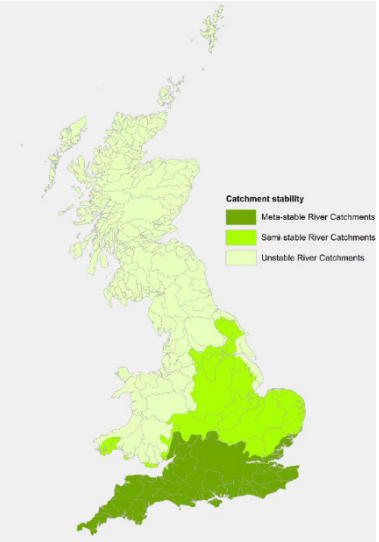
Website link https://www.bgs.ac.uk/datasets/bgs-geoscour-premium/ ; https://www.bgs.ac.uk/datasets/bgs-geoscour-open/

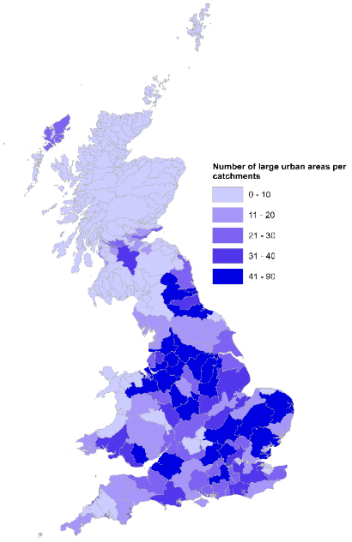
The BGS GeoScour datasets provide a generalised overview of the natural characteristics and properties of catchment and riverine environments for the assessment of river scour in Great Britain.

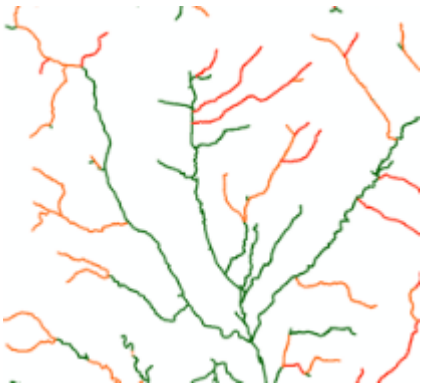
The GeoScour dataset comprises three different tiers of geographical information system (GIS) data containing eleven different data layers. Each tier represents a different scale of assessment from a high-level catchment through sub-catchment data to detailed river-reach data. The datasets are polygon (area) layers and river lines, which are described using straightforward classifications and enabling a scour susceptibility assessment.

The Premium licensed dataset contains all the datasets in GeoScour Open plus five additional, detailed layers at the tier 3 (riverine; 1:50 000) level:

- river morphology
- river geological susceptibility:
- river average geological susceptibility
- river best geological susceptibility
- river worst geological susceptibility







6. Mineral and Energy Datasets

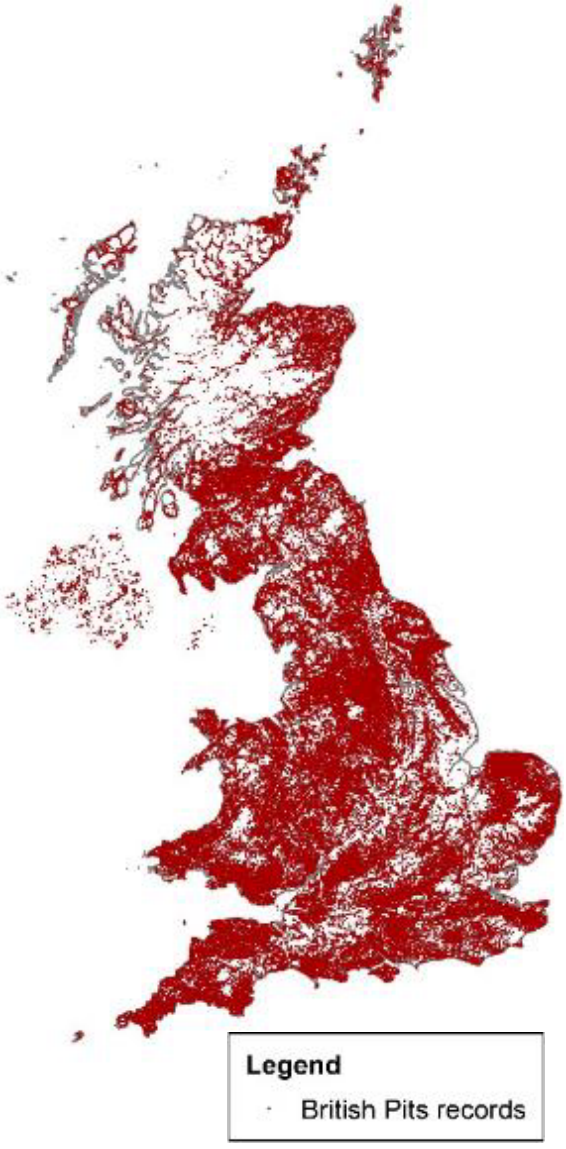
6.1. BRITPITS

Scale	N/A
Coverage	Great Britain and Northern Ireland
Format	Database tables and GIS point data (ESRI, MapInfo, other by request)
Price	Index level data: Free. Subject to data preparation fee. £50 per region (14 regions in total). Subject to number of users, licence fee and data preparation fee.

Website link https://www.bgs.ac.uk/products/minerals/BRITPITS.html

The BritPits (an abbreviation of British Pits, and the word 'pits' is used here to include both surface and underground mineral workings) database holds information on:

- names of mines, quarries, oil wells, gas wells, ash and desulphogypsum plants
- geographic location
- address
- operator
- mineral planning authority
- geology
- mineral commodities produced
- end-uses where known



Three different versions of BRITPITS are available:

Full dataset

- Includes all entries in the BRITPITS database including historic sites. Over 230 000 total entries.
- The data is split into 17 regions (see map) but for licencing purposes is supplied as 15 regions (Isle of Man is supplied with Northern Ireland, Channel Islands are supplied with South West England).
- Data supplied as Excel file and/or GIS point layer

Active, inactive and dormant data

- Includes only the active, inactive and dormant mines/quarries. Approx 3300+ entries
- Dataset licensed as complete GB coverage
- Data supplied as Excel file and/or GIS point layer

Index data

- 4 attributes: Easting, Northing, Status, Name. This is a free dataset available as a WMS layer or via the onshore GeoIndex

6.2. BGS Total Organic Carbon

Scale	N/A
Coverage	Great Britain
Format	Excel spreadsheet or GIS point data (ESRI, MapInfo, others available by request)
Price	On request. Subject to number of users, licence fee and data preparation fee.

Website link https://www.bgs.ac.uk/products/energy/TotalOrganicCarbon.html

Total organic carbon is a measure of the dry weight per cent of organic carbon within hydrocarbon source rocks. Hydrocarbons, including natural gas (principally methane, ethane and propane), may be generated by the heating of organic carbon through burial over geological time.

A shale with low concentrations of organic carbon (typically below 2%) probably won't have the capacity to produce oil or gas in useful quantities. It should also be noted that a high TOC value is not necessarily an indicator of shale gas potential. The gas prospectivity of a rock is heavily influenced by the kerogen types within the organic matter, including that derived from plankton, algae, spores, pollen, plant fragments. These can affect gas production, rock porosity and the rates at which gas may be released.

The Total Organic Carbon dataset is available as an excel spreadsheet or as points in GIS format.

6.3. BGS Vitrinite Reflectance

Scale N/A

Coverage Great Britain

Format Excel spreadsheet or GIS point data (ESRI, MapInfo, others available by request)

Price On request. Subject to number of users, licence fee and data preparation fee.

Website link https://www.bgs.ac.uk/products/energy/VitriniteReflectance.html

Vitrinite reflectance is used to assess the thermal maturation of a source rock. Vitrinite is a maceral (microscopic woody tissue, such as stems, bark, root and twigs) that is formed through the thermal alteration of lignin and cellulose in plant cell walls. Rocks buried at depth are subject to higher temperatures and as this increases vitrinite is altered through a process known as aromatization which increases its reflective properties.

The BGS Vitrine Reflectance dataset is available as an excel spreadsheet or as points in GIS format.

7. GeoCoast

7.1 GeoCoast Premium

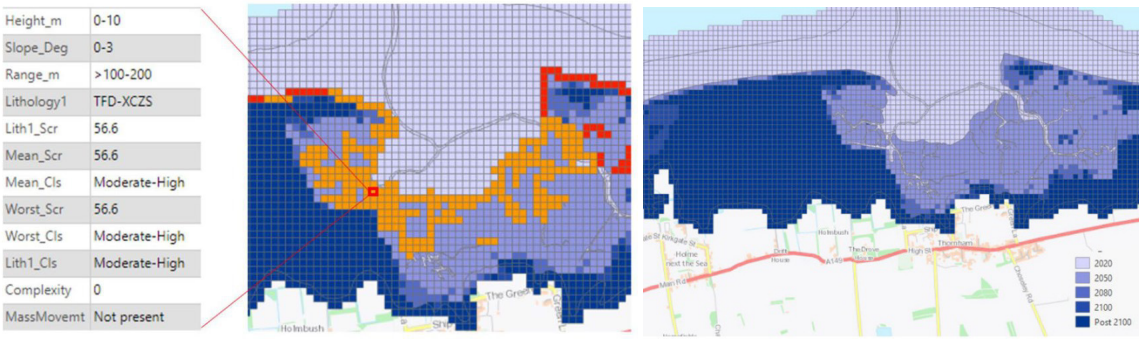
Scale	1:50 000
Coverage	Great Britian
Availability	Licenced
Format	GIS vector grids (ESRI, others available on request)
Price	Coastal grid data (inc flooding): £825 per shoreline management plan; Coastal erosion data: £5300 for the national dataset.

Subject to number of users, licence fee and data preparation fee.

Website link https://www.bgs.ac.uk/datasets/geocoast-premium/

GeoCoast is an integrated GIS package of datasets designed to inform and support coastal management and adaptation. It is based on the outputs of numerous research programmes, stakeholder advice and data analytics to provide data sufficient for users to analyse and assess a range of coastal threats and perils.

It can be used to underpin coastal decision making and planning relative to coastal inundation, erosion and climate change impacts. The datasets are compatible with shoreline management plan areas and are targeted at coastal practitioners including regulatory bodies, local authorities and asset owners, but anyone with an interest in the coast can use it.

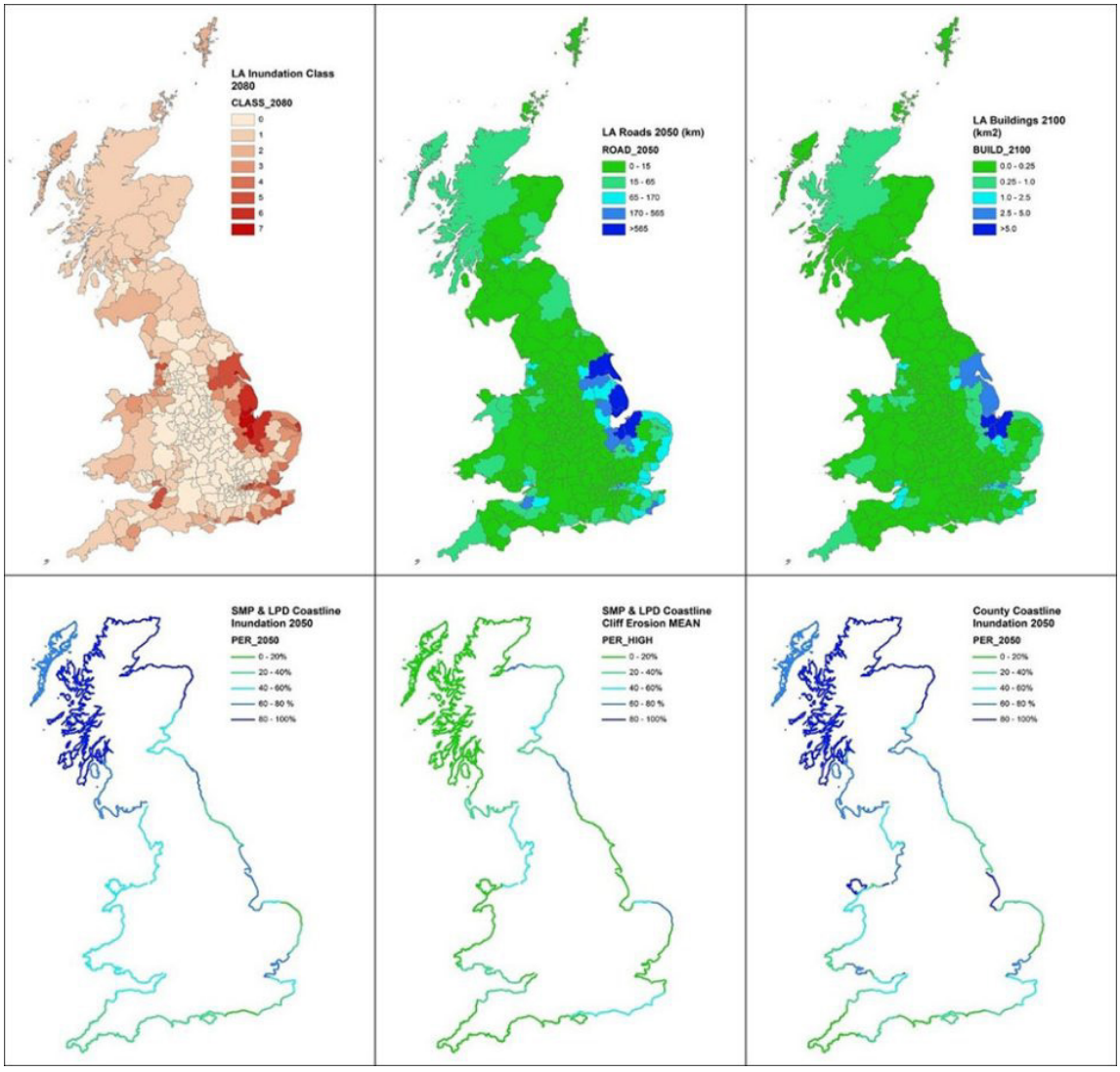


7.2 GeoCoast Open

Scale	Multiple
Coverage	Great Britain
Availability	Free
Format	GIS point data and vector polygon (ESRI, other formats available on request)
Uses	National-regional level use

Website link https://www.bgs.ac.uk/datasets/geocoast-open/

GeoCoast Open provides a range of historic images and diagrams extracted from our archives, memoirs and other publications that can provide a reference for coastal change. It also contains a detailed suit of statistical data based on the underlying datasets (GeoClimate Premium). These include, for example, percentage of county at threat from inundation and percentage of county coastline with high susceptibility to erosion. In addition, there is a tool to compare or share best practise at a regional scale and streamline the consideration of multiple underlying datasets through a simple, high-level scheme, presented as domains.



8. GeoClimate

8.1 GeoClimateUKCP09 Premium

Scale Quasi – 1:50 000

Coverage Great Britain

Availability Licensed

Format GIS polygon data (ESRI, others available by request)

Price 1st sq km: £10; Subsequent sq km: £1; Total dataset: £30 000

Website link https://www.bgs.ac.uk/datasets/geoclimate-premium/

The GeoClimate Shrink–swell products are national datasets showing potential change in subsidence due to changes in climate. It has been developed by considering climate projections and the associated changes in soil moisture, alongside the geotechnical properties of the ground to provide long term, modelled analysis for resilience assessments.

GeoClimateUKCP09 Premium is a quasi- 1:50 000 scale product (due to the variable scales of input datasets), provided as area polygons, for 5 time period envelopes, centred on 2020, 2030, 2040, 2050 and 2080. It is based on the medium emissions scenarios, and provides projections for average, wetter and drier climate conditions. For each scenario it describes five categories of projected susceptibility, from highly unlikely to extremely likely.

Features	GeoClimateUKCP09 Premium
Time slices available (11 yr window)	2020 (2015-2025), 2030 (2025-2035), 2040 (2035-2045), 2050 (2045-2055), 2080 (2075-2085) plus historical 2010 (2005-2015) **6 in total**
Historical time period (11 year window)	2010 (2005-2015)
Emissions scenario	Medium emissions
Climate models	11 regional climate models (CEH)
GeoClimate categories	5
Climate data scale	Daily 2 km grid
Statistical outputs	Medium, drier, and wetter for each scenario projection (18)
Format	ESRI vector polygon data
Difference maps	15–3 for each time slice

8.2 GeoClimateUKCP09 Open

Scale 2 km gridded dataset

Coverage Great Britain

Availability Free

Format 2 km gridded GIS data (ESRI, MapInfo, others available by request)

Uses National-level use

Website link https://www.bgs.ac.uk/datasets/geoclimate-open/

The GeoClimate products are national-scale datasets covering Great Britain.

GeoClimateUKCP09 Open is provided for three time periods: 2030s; 2050s, and 2080s, with one projection provided for each time period based on the average outcome for the medium emissions scenario and the most susceptible GeoSure value (worst case) within the grid cell.

UKCP09 Emissions scenario	Medium emissions
Temporal projections (11 year windows)	2030s (2025-2035), 2050s (2045-2055), 2080s (2075-2085)
Projections provided	Median average

8.3 GeoClimateUKCP18 Premium

Scale Quasi – 1:50 000

Coverage Great Britain

Availability Licensed

Format GIS polygon data (ESRI, others available by request)

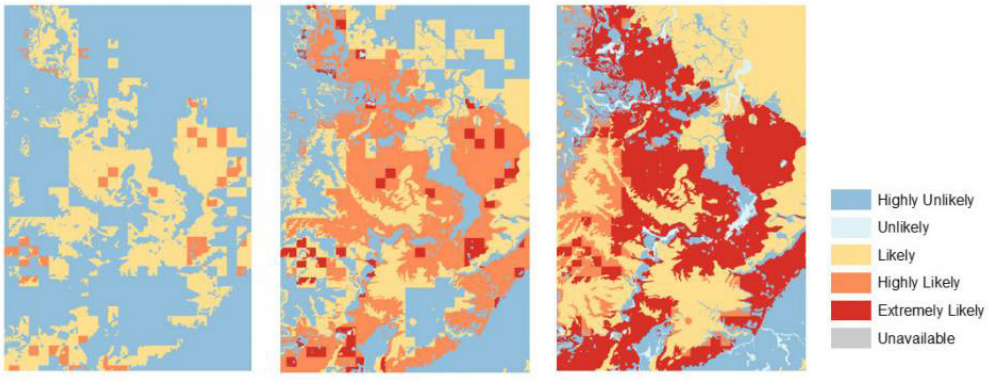
Price On request

Website link https://www.bgs.ac.uk/datasets/geoclimateukcp18-premium/

The GeoClimate Shrink–swell products are national datasets showing potential change in subsidence due to changes in climate. They have been developed by considering climate projections and the associated changes in soil moisture, alongside the geotechnical properties of the ground to provide long term, modelled analysis for resilience assessments.

GeoClimateUKCP18 Premium is a quasi-1:50 000 scale product (due to the variable scales of input datasets), provided as area polygons, for 2 projected 11-year windows, centred on 2030 and 2070. It is based on the UK Climate Projections 2018 (UKCP18) high emissions scenario, and provides projections for average, wetter and drier climate conditions. For each scenario it describes five categories of projected susceptibility, from highly unlikely to extremely likely.

Features	GeoClimateUKCP18 Premium
Time slices available (11 yr window)	2030 (2025-2035), 2070 (2065-2075) plus historical1990 (1985-1995) **3 in total**
Historical time period (11 year window)	1990 (1985-1995)
Emissions scenario	Higher emissions (8.5)
Climate models	12 Representative Concentration Pathways
GeoClimate categories	5
Climate data scale	Daily 2.2 km grid
Statistical outputs	Medium, drier, and wetter for each scenario projection (9)
Format	ESRI vector polygon data
Difference maps	6–3 for each time slice



GeoClimate premium 2070 dataset showing the likelihood that foundations will be affected by wetter (a), average (b) and drier (c) conditions.

8.4 GeoClimateUKCP18 Open

Scale 2 km gridded dataset

Coverage Great Britain

Availability free

Format GIS polygon data (ESRI, others available by request)

Uses national-level use

Website link https://www.bgs.ac.uk/datasets/geoclimateukcp18-open/

The GeoClimate products are national-scale datasets covering Great Britain.

GeoClimateUKCP18 Open is provided for two time periods: 2030s and 2070s, with one projection provided for each time period based on the average outcome for the UKCP18 higher emissions scenario and the most susceptible GeoSure value (worst case) within the grid cell.

UKCP18 Emissions scenario	Higher emissions (RCP8.5)
Temporal projections (11 year windows)	2030s (2025-2035), 2070s (2065-2075)
Projections provided	Median average