



British
Geological
Survey



2026-2027

PRODUCT PORTFOLIO

Foreword

The British Geological Survey (BGS) is a world-leading geological survey, focusing on public good science for Government and research to understand earth and environmental processes. We are the UK's premier provider of objective and authoritative geoscientific data, information and knowledge to help society to:

- use its natural resources responsibly
- manage environmental change
- be resilient to environmental hazards

We provide expert services and impartial advice in all areas of geoscience. As a public sector organisation, we are responsible for advising the UK Government on all aspects of geoscience as well as providing impartial geological advice to industry, academia and the public. Our client base is drawn from the public and private sectors both in the UK and internationally. BGS is a component body of the Natural Environment Research Council (NERC), part of UK Research and Innovation (UKRI).

Data products

BGS produces a wide range of data products that align to Government policy and stakeholder needs. These include baseline geological data, engineering properties and geohazards datasets. These products are developed using in-house scientific and digital expertise and are based on the outputs of our research programmes and substantial national data holdings. Our products are supported by stakeholder focus groups, identification of gaps in current knowledge and policy assessments. They help to improve understanding and communication of the impact of geo-environmental properties and hazards in Great Britain, thereby improving society's resilience and enabling people, businesses and governments to make better-informed decisions.

This portfolio

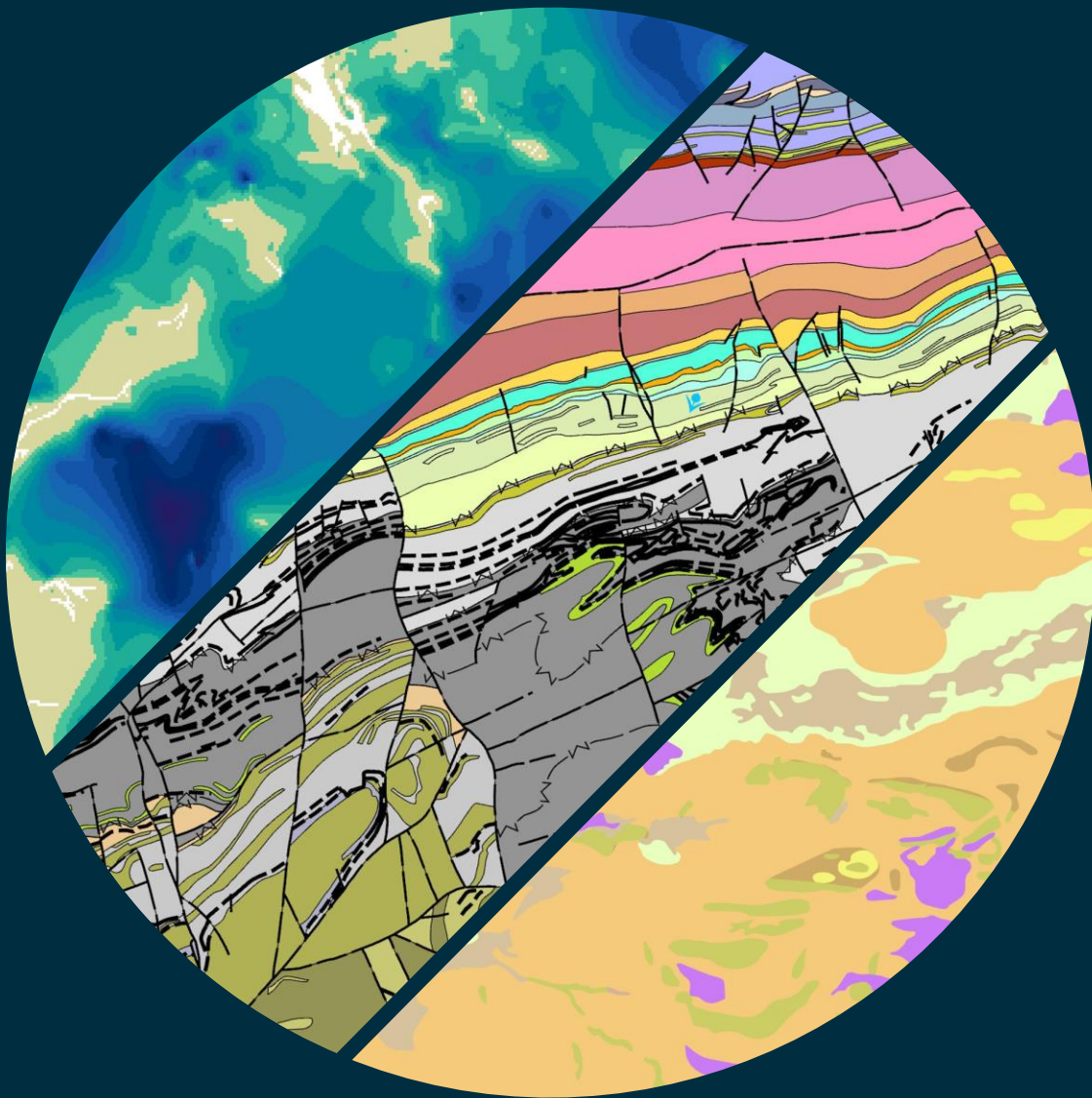
This portfolio is a catalogue of the BGS data products that are available to licence for commercial use. It has been designed to improve the accessibility and visibility of BGS's datasets to stakeholders by:

- providing an overview of each product
- highlighting the benefits and key features of interest
- identifying the market sectors to which each product is relevant
- demonstrating applicability of BGS data to solving sector-specific challenges

Information on pricing and licencing are provided along with links to additional, product-specific resources and contact information. The datasets are grouped into five themes and should be navigated using the links on the contents page. If viewing digitally, we recommend viewing in two-page, side-by-side mode for the best user experience. If printing, we recommend printing pages front and back, to create a 'one-pager' product card for each dataset. A QR code that links to the relevant product web page has been included to help readers using printed versions of this portfolio access further information on each of the datasets.

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BASELINE GEOLOGY

BGS's baseline geology products provide information on the type, classification, extent and variability of rocks, sediments and soils in Great Britain.

These datasets include:

[BGS Geology 10/25K](#) Site-scale geological mapping

[BGS Geology 50K](#) National coverage geological mapping

[BGS Geology 250K](#) Generalised national geology map

[Soil parent material model](#) National mapping of soil-forming materials

[Superficial deposit thickness model](#) Modelled regional variation in the thickness of superficial and unconsolidated deposits

Overview

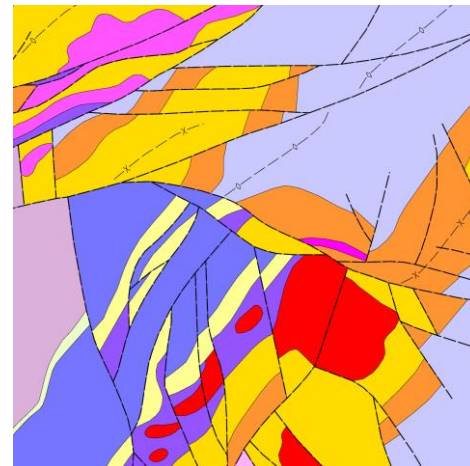
BGS Geology 10K and 25K are BGS's most detailed digital geological mapping datasets, representing the highest-resolution geological interpretation available for Great Britain. They are derived from 1:10 000-scale surveys (with some 1:25 000-scale coverage in upland areas) and captures bedrock, superficial deposits, mass-movement deposits, artificial ground and linear features. The dataset covers around 52 per cent of Great Britain, with a strong focus on urban centres and transport corridors and is continually expanded as BGS digitises its remaining paper archives and completes new surveys.

Product benefits

- Site-scale geological insight enables understanding of ground conditions before on-site or intrusive investigation
- Geological map compilation by regional geological experts from the premier provider of British geological data
- Growing data coverage
- Accessible GIS data formats

Key features

- High-resolution mapping: 1:10 000 scale (± 10 m accuracy) with some 1:25 000-scale coverage (± 25 m)
- Four thematic layers:
 - bedrock geology
 - superficial deposits
 - mass-movement deposits
 - artificial ground
- Additional data on linear features (faults; mineral veins; coal seams; landforms, etc.)
- Rich attribution provides details of lithology, lithostratigraphy and chronostratigraphy, and applies the national standards of geological classification, the BGS Lexicon and the BGS Rock Classification Scheme
- Applies national geological standards of symbology and colour scheme
- Extensive coverage of urban areas and transport corridors, prioritised where development pressures are highest
- Regularly updated to reflect new surveys, corrections and improved geological interpretations
- GIS vector format for ease of geospatial analysis



Licensing

Indicative pricing for internal business use

£1.71 per km²

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Target markets

- Engineering and geotechnical consultants
- Urban planners, local authorities and environmental consultants
- Environmental and geohazard specialists
- Mineral planners and resource managers
- Academics

Challenges faced by customers

- Lack of high-resolution data suitable for preliminary, remote assessments
- Need for digital geospatial data rather than legacy paper maps
- Uncertainty about subsurface conditions making early-stage assessment difficult without authoritative mapping
- Time consuming compilation of robust geological evidence to meet legislative and regulatory requirements
- Delays and cost overruns if challenging ground conditions are not identified early
- Early identification of artificial ground, infill or legacy industrial modifications on brownfield sites

Use cases

- Development screening: engineers need to identify geological constraints such as faulting, landslides or problematic lithologies before intrusive investigation at potential sites
- Environmental impact assessments: planners need to document baseline geological conditions and assess development impacts
- Brownfield redevelopment: identification of artificial ground, infill or legacy industrial modifications helps determine remediation needs and engineering constraints
- Infrastructure planning: transport authorities can assess geological conditions along proposed routes
- Mineral resource evaluation: users can identify nearby sand, gravel or bedrock resources and assess whether development may sterilise them

Contact

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Overview

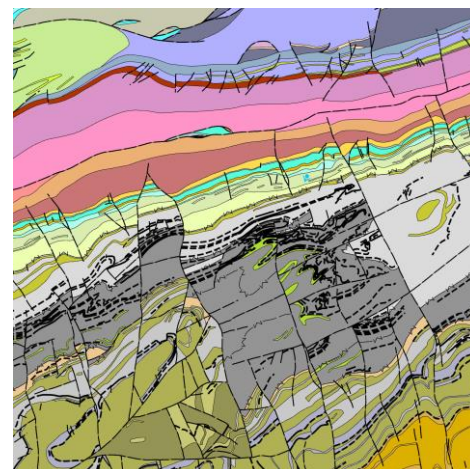
BGS Geology 50K provides 1:50 000-scale geological mapping across Great Britain. It provides 99 per cent bedrock coverage and 95 per cent superficial deposits coverage, derived from decades of field surveys, legacy paper maps and modern digital capture. The dataset captures bedrock, superficial deposits, mass-movement deposits, artificial ground and linear features. It is designed for neighbourhood- to borough-scale understanding of geology.

Product benefits

- National coverage and ± 50 m spatial resolution support early-stage assessments where site-scale mapping (for example, 1:10 000) is not yet required
- Geological map compilation by regional geological experts from the premier provider of British geological data
- Accessible GIS data formats and free 'view only' services

Key features

- Extensive national coverage: about 236 000 km², covering almost all of Great Britain
- 1:50 000 scale (± 50 m)
- Four thematic GIS layers:
 - bedrock geology
 - superficial deposits
 - mass-movement deposits
 - artificial ground
- Additional data on linear features (faults; mineral veins; coal seams; landforms, etc.)
- Rich attribution provides details of lithology, lithostratigraphy and chronostratigraphy, and applies the national standards of geological classification, the BGS Lexicon and the BGS Rock Classification Scheme
- Applies national standards of symbology and colour scheme
- Regularly updated to incorporate new surveys, digital capture and improved geological interpretations
- GIS vector format for ease of geospatial analysis
- Interoperability with other BGS datasets: BGS Geology 50K is the baseline dataset from which many other BGS datasets are derived



Licensing

Indicative pricing for internal business use

£0.23 per km²

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Target markets

- Engineering and geotechnical consultants
- Urban planners and local authorities
- Environmental and geohazard specialists
- Mineral planners and resource managers
- Academics

Challenges faced by customers

- Difficulty accessing consistent geological information at national or regional scale from disparate sources
- Need for digital geospatial data rather than legacy paper maps
- Uncertainty about subsurface conditions making early-stage assessment difficult without authoritative mapping
- Time-consuming compilation of robust geological evidence to meet legislative and regulatory requirements
- Challenging ground conditions cause delays and cost overruns if not identified early
- Complexity of national asset networks with a need to understand ground conditions for thousands of distributed assets

Use cases

- Regional planning: local authorities require understanding of geological constraints across borough-scale areas, informing development strategies
- Mineral safeguarding: assess whether proposed developments may sterilise mineral resources
- Environmental impact assessments: consultants need to establish baseline geological conditions for major infrastructure or redevelopment projects
- Brownfield redevelopment: identification of artificial ground helps determine remediation needs and engineering constraints
- Natural capital and land-use reviews: geological information supports assessments of soil resources, groundwater recharge and ecosystem services

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Overview

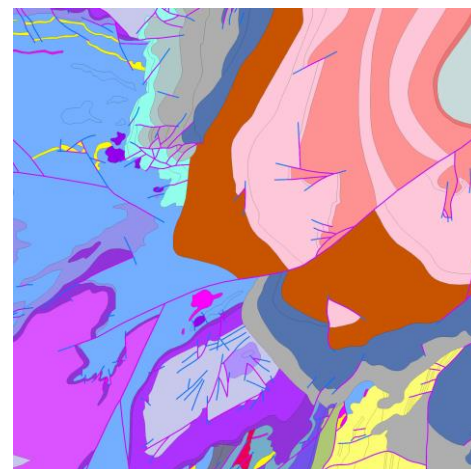
BGS Geology 250K is a regional-scale digital geological dataset covering Great Britain at 1:250 000 scale, derived from BGS's 1:250 000-scale bedrock geological maps. The dataset contains GIS line and polygon data representing bedrock geology and faults, providing a generalised geological view suitable for regional analysis and strategic planning.

Product benefits

- Provides a consistent, national-scale geological framework for Great Britain
- Offers geological insight where highly detailed geological mapping is not required, for example display or education
- Delivers geological information in GIS-ready formats for integration with other spatial datasets
- Based on authoritative BGS geological mapping and classification standards

Key features

- National coverage of Great Britain
- 1:250 000 scale (± 250 m)
- Two thematic GIS layers:
 - bedrock geology
 - faults
- Geological polygons attributed with lithology, lithostratigraphy and chronostratigraphy, and applies the national standards of geological classification, the BGS Lexicon and the BGS Rock Classification Scheme
- Applies national standards of symbology and colour scheme
- GIS vector format for ease of geospatial analysis
- The data is not recommended for site- or local-scale use (regional and national overviews only)



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Indicative pricing for internal business use

£0.007 per km²

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Target markets

- Educators and academics
- National Government and regulators
- River trusts

Challenges faced by customers

- Lack of accessible, low-cost, national geology information
- Need for rapid, general overview of bedrock geology and major fault systems for a region, county or catchment

Use cases

- Education: regional geological and geoscience studies
- National assessment: strategic infrastructure and land-use overviews
- Display resources: creating national geological map display materials
- Scoping assessment: broad geological context mapping for natural resource, environmental and transport infrastructure development investigations
- Catchment assessment: broad-scale geological context for catchment-level river planning

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Overview

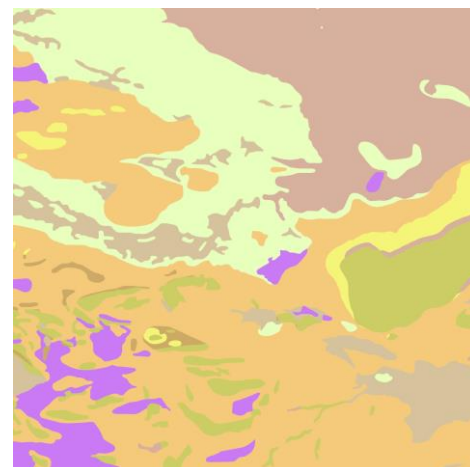
BGS's soil parent material model maps the geological materials from which soils in Great Britain develop. It describes the near-surface weathered zone, which typically comprises the material from the base of the soil profile down to 3 m. The dataset integrates 1:50 000-scale geological mapping, terrain data and a wide range of BGS geochemical, geotechnical and borehole records to provide a consistent representation of soil-forming materials across Great Britain. It includes attributes such as parent material lithology, grain size, soil texture, soil group, carbonate content, soil depth and susceptibility to erosion by water or wind.

Product benefits

- Provides a scientifically robust foundation for understanding how soils form, behave and vary across landscapes
- Offers insight into where site-specific soil data is sparse, enabling evidence-based decisions at regional and national scales
- Supports environmental modelling, land-use planning and agricultural management
- Improves assessments of land capability, natural capital and ecosystem services
- Improves understanding of how geology influences soil vulnerability to erosion, run-off and wind deflation

Key features

- National coverage across Great Britain
- 1:50 000 scale (± 50 m)
- Detailed attribute set, including:
 - generalised parent material lithology
 - European Soil Bureau parent material type
 - parent material grain size
 - soil group (light; medium; heavy soils)
 - soil layer thickness
 - soil texture (sand; silt; clay; loam; peat and chalk variants)
 - carbonate content ranking
 - susceptibility to water erosion, soil wash and wind erosion
- Derived from multiple authoritative datasets, including BGS geological mapping, topsoil geochemistry, borehole records, geotechnical data and OS Terrain 50
- GIS vector format for ease of geospatial analysis
- Open access available for a generalised, low-resolution version of the data



Licensing

Indicative pricing for internal business use

£0.35 per km²

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Target markets

- Environmental scientists and consultants
- Agricultural advisors and land managers
- Local authorities and planners
- Hydrologists and flood risk specialists
- Geotechnical and engineering consultants
- Academics

Challenges faced by customers

- Limited soil data availability makes assessing soil behaviour difficult without a proxy dataset
- Fragmented information sources on factors influencing soil characteristics
- Inconsistent local mapping due to variation in soil-forming factors over short distances
- Need for digital geospatial data rather than legacy paper maps

Use cases

- Agricultural planning: identifying areas with shallow, sandy or erosion-prone soils to guide crop selection or soil protection measures
- Catchment management: modelling sediment sources and predicting where run-off or soil wash is likely during heavy rainfall
- Environmental impact assessments: establishing baseline soil and subsoil conditions for infrastructure, renewable energy or housing developments
- Digital soil modelling: combining parent material data with climate and land-use layers to generate high-resolution soil property maps
- Carbon and natural capital assessments: understanding where carbonate-rich or organic parent materials influence soil chemistry and ecosystem services
- Erosion mitigation planning: identifying slopes and soil textures most susceptible to water or wind erosion

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Overview

BGS's superficial deposit thickness model presents the modelled regional variation in thickness of superficial and unconsolidated deposits across Great Britain. These deposits include fluvial sediments, glacial drift, marine sands, peat and anthropogenic materials. The dataset integrates borehole records, 1:50 000-scale geological mapping and terrain elevation data to model both the thickness of superficial deposits and the elevation of geological rockhead (the top of bedrock). It is designed for use at the 1:100 000 scale, with an average vertical precision of ± 5 m.

The superficial deposit thickness model consists of four raster components:

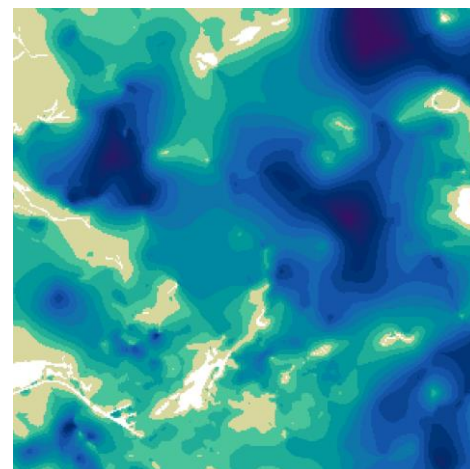
- observation-driven model: direct interpolation of thickness from borehole data
- terrain-adjusted model: thickness model combining boreholes, mapped superficial boundaries and terrain
- rockhead elevation model: interpolated elevation of the bedrock surface relative to Ordnance Datum
- data distance (DataDist) grid: distance from each grid cell to the nearest borehole or mapped boundary, used as a proxy for uncertainty

Product benefits

- Derived from expert interpretation of a national repository of borehole logs with bespoke data-cleaning workflows applied
- Supports early-stage planning, feasibility studies and conceptual ground models ahead of site investigation
- Provides rockhead elevation, critical for engineering design, hydrogeology and environmental assessments
- Highlights uncertainty via the DataDist layer, helping users judge confidence in modelled values
- Integrates field mapping of superficial deposit coverage with site-specific observations of deposit thickness from boreholes and topography

Target markets

- Civil and geotechnical engineers
- Hydrogeologists
- Environmental scientists and consultants
- Geologists and geomorphologists
- Local authorities and planners



Licensing

Indicative pricing for internal business use

£0.18 per km²

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Key features

- National coverage across Great Britain, aligned with BGS 1:50 000-scale geological mapping
- 1:100 000-scale with a vertical modelled precision of ± 5 m elevation, presented as 50 m raster cells aligned to OS Terrain® 50 Digital Terrain Model
- Integration of borehole, geological mapping and terrain data
- Modelled superficial thickness and rockhead elevation values
- Minimum 1 m thickness applied where superficial deposits are mapped
- Uncertainty proxy via DataDist
- Designed for regional- to local-scale use (not site-specific)
- Clear documentation of limitations and assumptions
- Open access available for a generalised, low-resolution version of the data

Challenges faced by customers

- Time-consuming manual interpretation of geological maps, topography and boreholes
- Limited access to borehole logs
- Difficulty understanding regional variation in superficial thickness along linear asset networks
- Uncertainty in rockhead depth before site investigation
- Need to understand uncertainty levels in modelled data

Use cases

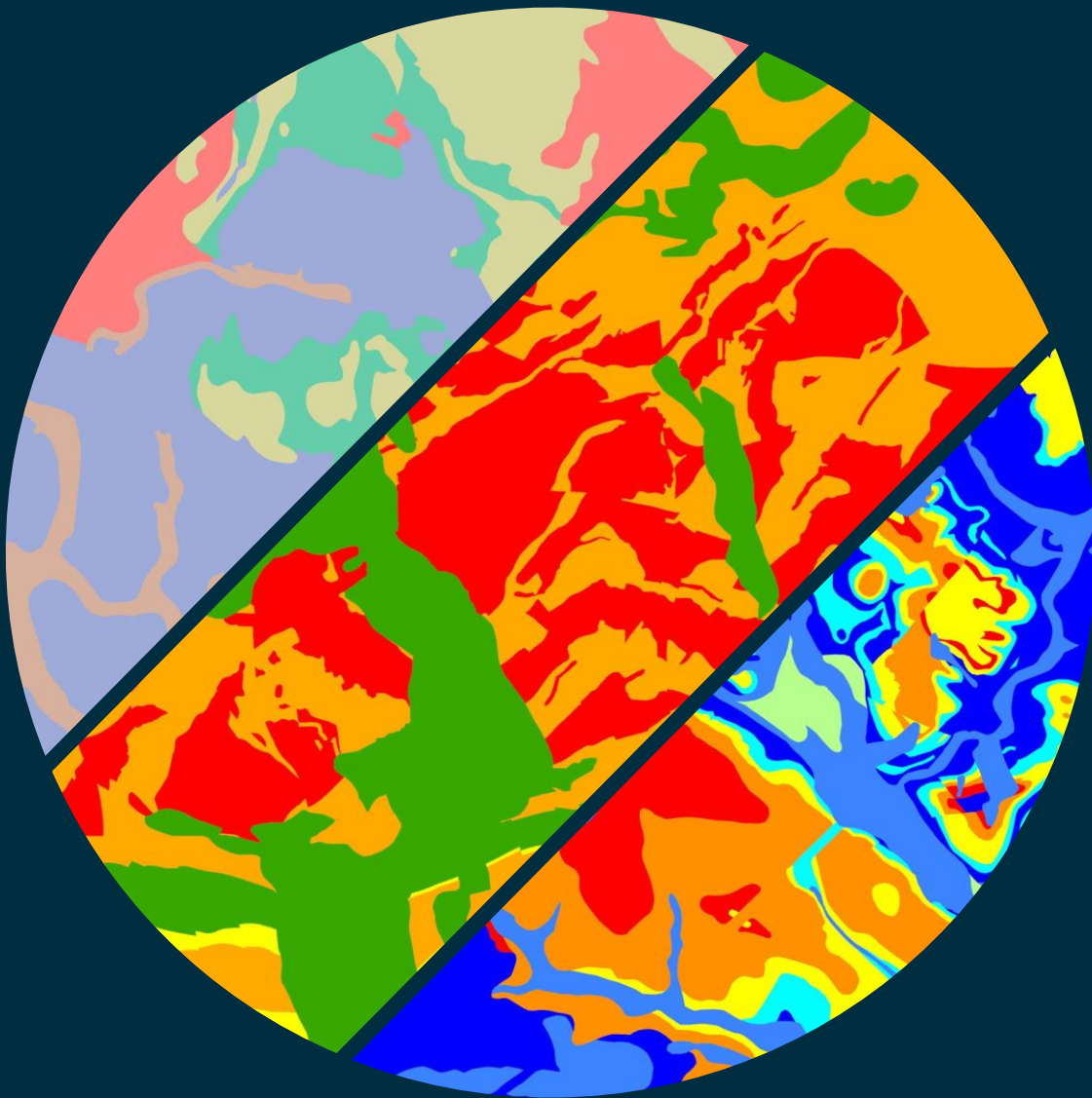
- Prefeasibility engineering studies: estimating likely excavation depths or foundation requirements
- Groundwater modelling: identifying superficial aquifers and confining layers
- Flood risk and drainage assessments: understanding sediment thickness in floodplains
- Route selection for infrastructure: screening corridors for areas of deep superficial deposits
- Environmental impact assessments: establishing baseline geological conditions
- Research into glacial and post-glacial landscape evolution: using thickness patterns to infer palaeo-topography

Contact

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ENGINEERING GEOLOGY

BGS's engineering geology products map the key engineering characteristics of the geology of Great Britain, providing classifications that indicate the expected engineering characteristics.

These datasets include:

Bulking volume Estimated bulking and compaction factors for geological materials

Corrosivity (ferrous) Classification of the corrosivity of ground conditions to buried ferrous (iron and steel) infrastructure

Discontinuities Identification of the presence and type of discontinuities (structural weakness) in geological materials

Engineered fill Classification of suitability of geological materials for use as engineered fill material

Excavatability Estimated difficulty of excavation for geological materials

Foundation conditions Assessment of suitability for geological materials to host foundations

Strength Assessment of the strength of geological materials

Sulfate/sulfide potential Identification of where sulfate and sulfide minerals in geological materials may pose a risk to buried concrete

Resistivity Modelled resistivity values for geological materials

Overview

The BGS Civils engineering geology datasets translate geological information into practical assessments of how the ground is likely to behave during construction and civil engineering projects. These datasets cover themes such as bulking volume, corrosivity, discontinuities, engineered fill, excavatability, foundation conditions, strength and sulfate/sulfide potential. Each dataset provides nationally consistent layers in GIS formats that help users understand engineering constraints before intrusive investigation.

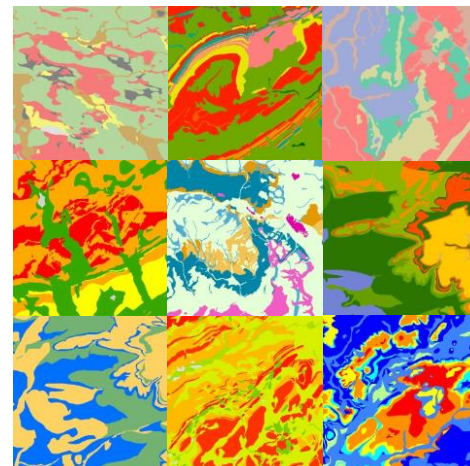
Product benefits

- Reduce uncertainty in feasibility and concept design
- Identify potentially challenging ground conditions before committing to costly site investigation
- Improve cost forecasting, especially for earthworks, foundations and material management
- Support planning and regulatory compliance with authoritative geological intelligence
- Enhance infrastructure resilience, particularly for utilities and transport networks
- Integrate engineering relevant geological data into asset management systems and environmental assessments
- Designed to complement, not replace, site-specific geotechnical testing

Key features

- National coverage across Great Britain
- 1:50 000 scale (± 50 m)
- Multiple engineering geology themes, including:

▪ bulking volume	▪ excavatability
▪ corrosivity (ferrous)	▪ foundation conditions
▪ discontinuities	▪ strength
▪ engineered fill	▪ sulfate/sulfide potential
- Derived from authoritative BGS data source's, such as our geological mapping and the BGS National Geotechnical Properties Database
- GIS vector format for ease of geospatial analysis
- Attribute-rich polygons describing engineering behaviour and geological context



Licensing

Indicative pricing for internal business use

BGS Civils bundle: £0.58

Individual layers: £0.35

Prices per km²

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

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Target markets

- Civil and geotechnical engineers
- Environmental consultants
- Transport and utilities infrastructure owners and operators
- Local authorities and planners
- Developers and contractors

Challenges faced by customers

- Unexpected ground conditions leading to delays, redesigns or increased costs
- Fragmented or inconsistent data sources, making early-stage assessment difficult
- High maintenance costs of buried assets due to degradation caused by ground conditions
- Regulatory pressures requiring evidence of ground risk consideration
- Challenges in planning earthworks, foundation design and material re-use
- Difficulty estimating excavation effort, settlement risk or chemical aggression

Use cases

- Early-stage site screening: identifying excavation considerations, geotechnical properties or corrosive soils before design begins
- Earthworks planning: using excavatability, bulking and strength datasets to estimate plant needs and cut and fill volumes
- Foundation feasibility: assessing whether shallow foundations are viable or whether piling is likely to be needed
- Utility route planning: mapping corrosivity, discontinuities and sulfate/sulfide potential along pipeline or cable corridors
- Slope and embankment design: using discontinuities and strength data to assess stability
- Asset management prioritisation: identifying where ground hazards may threaten existing infrastructure

Contact

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Overview

BGS Civils: bulking volume provides estimated bulking and compaction factors for geological materials across Great Britain. It is derived from BGS's 1:50 000-scale geological mapping and engineering geology expertise, and gives indicative values for how different soil and rock types change in volume when excavated, transported, stockpiled or compacted. The dataset is designed for use in civil engineering, earthworks planning, infrastructure design and environmental assessment, helping users anticipate material behaviour before intrusive investigation.

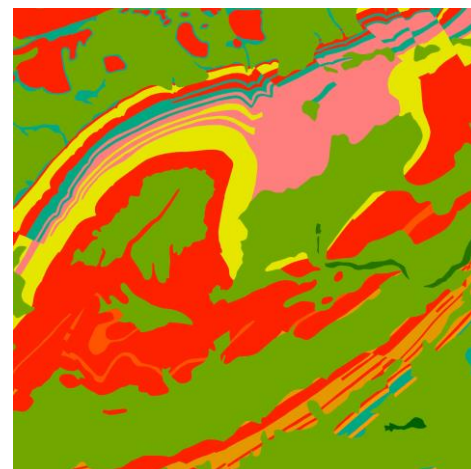
The dataset is part of the wider BGS Civils suite, which provides engineering-relevant geological intelligence for early-stage design, asset management and risk assessment.

Product benefits

- Bulking factors compiled from scientific literature and applied nationally
- Early estimates of cut and fill volumes before site investigation
- Indicative bulking and compaction behaviour for a wide range of geological materials
- Reduced uncertainty in material handling, transport and disposal planning
- Better forecasting of stockpile sizes, haulage requirements and landfill needs
- Improved environmental and carbon assessments, as material movement is a major contributor to project emissions

Key features

- National coverage across Great Britain
- 1:50 000 scale (± 50 m)
- Bulking and compaction factors for a wide range of rock and sediment geological materials sourced from scientific literature
- GIS vector format for ease of geospatial analysis
- Consistent classification based on BGS's engineering geology expertise and geotechnical literature
- Part of the BGS Civils suite, which can be combined with datasets about geological materials and their engineering characteristics



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Target markets

- Civil and geotechnical engineering consultants
- Earthworks contractors
- Infrastructure owners and designers
- Environmental and carbon assessment specialists
- Local authorities and planners

Challenges faced by customers

- Uncertainty estimating cut, fill and stockpile volumes without indicative bulking factors
- Increased costs from insufficient space for stockpiles or unexpected disposal costs
- Fragmented or inconsistent data on bulking factors leading to inconsistent assumptions across projects
- Limited early-stage ground information ahead of site investigation
- Inaccurate estimates hinder early carbon modelling for environmental and carbon accounting

Use cases

- Highway or rail corridor design: estimating cut and fill balance along long linear routes to optimise haulage and reduce carbon emissions
- Site redevelopment: predicting how much excavated material will expand when removed from foundations, basements or service trenches
- Stockpile planning: determining the land area required to store excavated material during construction
- Landfill and disposal forecasting: estimating the volume of material requiring off-site disposal once bulking is accounted for
- Carbon modelling: using bulking estimates to calculate haulage distances, fuel use and embodied carbon
- Early-stage risk assessment: identifying geological units likely to produce unexpectedly high bulking or compaction behaviour

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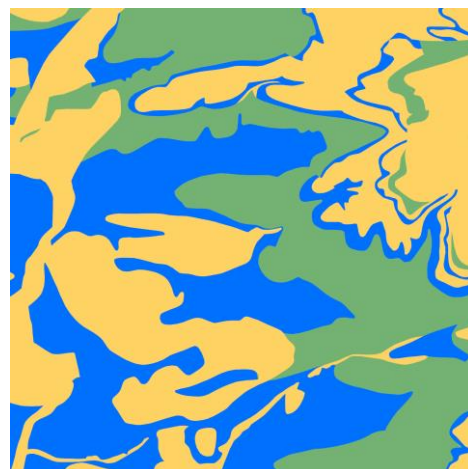
Web page QR code



Overview

BGS Civils: corrosivity (ferrous) classifies the corrosivity of near-surface ground conditions to buried ferrous (iron and steel) infrastructure across Great Britain. It translates 1:50 000-scale geological, geochemical and engineering geology information into a practical assessment of how likely soils, superficial deposits and shallow bedrock are to corrode ferrous materials. The dataset assigns each geological unit a corrosivity class, from non-aggressive to very highly aggressive, based on factors such as moisture content, acidity, organic content, sulfate presence and soil texture.

The dataset is part of the wider BGS Civils suite, which provides engineering-relevant geological intelligence for early-stage design, asset management and risk assessment.



Product benefits

- Early identification of corrosion risk before intrusive ground investigation
- Improved asset protection, helping engineers select appropriate materials, coatings and mitigation strategies
- Reduced life-cycle costs, as corrosion is a major cause of pipeline, cable and foundation failures
- Consistent, national-scale information, avoiding reliance on localised or inconsistent datasets
- Better long-term resilience planning, especially for utilities and transport networks with extensive buried assets

Key features

- National coverage across Great Britain, aligned with BGS's geological mapping
- 1:50 000 scale (± 50 m)
- Corrosivity classification for ferrous materials considering:
 - water content
 - redox status
 - pH
 - sulfates/sulfides
 - electrical resistivity
- GIS vector format for ease of geospatial analysis
- Consistent classification based on BGS engineering geology expertise and geotechnical literature
- Part of the BGS Civils suite, which can be combined with datasets about geological materials and their engineering characteristics

Licencing

Indicative pricing for internal business use

BGS Civils bundle: £0.58

Individual layers: £0.35

Prices per km²

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

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Target markets

- Utility companies
- Civil, environmental and geotechnical engineers
- Infrastructure owners and operators
- Local authorities and planners
- Contractors

Challenges faced by customers

- Unexpected and premature corrosion failures have high maintenance and replacement costs
- Limited early-stage ground information ahead of site investigation
- Fragmented or inconsistent data sources on all corrosion risk factors
- Regulatory requirements to demonstrate active management of corrosion risk
- Inefficient mitigation planning without susceptibility mapping

Use cases

- Pipeline route planning: identifying sections of a proposed pipeline that pass through highly corrosive soils, enabling targeted protection
- Foundation design: assessing whether steel piles or sheet piles require coatings, cathodic protection or alternative materials
- Utility asset management: prioritising inspection and replacement programmes for assets located in aggressive ground conditions
- Highway and rail projects: evaluating corrosion risk for buried drainage systems, culverts and retaining structures along long linear corridors
- Carbon and cost modelling: estimating long-term maintenance needs and embodied carbon associated with corrosion mitigation

Contact

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BGS Civils: discontinuities

Overview

BGS Civils: discontinuities identifies where geological discontinuities (such as bedding planes, joints, fractures, faults and other structural weaknesses) are likely to influence engineering behaviour in near-surface ground. It translates 1:50 000-scale geological mapping and engineering geology knowledge into a practical assessment of how discontinuities may affect excavation stability, slope performance, foundation design and ground/structure interaction.

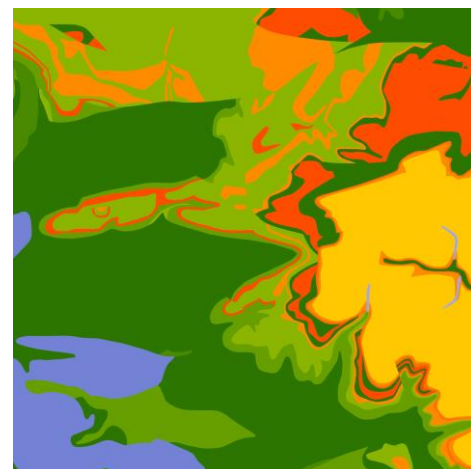
The dataset is part of the wider BGS Civils suite, which provides engineering-relevant geological intelligence for early-stage design, asset management and risk assessment.

Product benefits

- Anticipate excavation stability issues before intrusive investigation
- Identify geological units where blocky, fissile or highly fractured behaviour is likely
- Reduce uncertainty in slope design, foundation planning and earthworks
- Improve safety by highlighting areas where discontinuities may lead to rockfalls, slips or wedge failures
- Support cost forecasting by identifying where additional support, reinforcement or excavation methods may be required

Key features

- National coverage across Great Britain, aligned with BGS's geological mapping
- 1:50 000 scale (± 50 m)
- Discontinuity type classification including stratification planes, foliation planes and fractures as defined by the International Society for Rock Mechanics and by British Standard BS5930
- GIS vector format for ease of geospatial analysis
- Consistent classification based on BGS engineering geology expertise and geotechnical literature
- Part of the BGS Civils suite, which can be combined with datasets about geological materials and their engineering characteristics



Licensing

Indicative pricing for internal business use

BGS Civils bundle: £0.58

Individual layers: £0.35

Prices per km²

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Target markets

- Civil and geotechnical engineers
- Transport and utilities infrastructure owners and operators
- Contractors
- Local authorities and planners
- Slope stability specialists

Challenges faced by customers

- Unexpected excavation instability increases costs due to unforeseen support requirements
- Limited early-stage structural geology data ahead of site investigation
- Difficulty planning site health and safety ahead of excavation
- Difficulty predicting behaviour of weathered rock, which can complicate design

Use cases

- Highway or rail cuttings: identifying where discontinuities may cause block falls or require slope reinforcement
- Basement and foundation excavations: assessing whether rock masses will break into blocks or require controlled excavation
- Tunnel and trench design: understanding how jointing and bedding may influence stability during construction
- Slope stability assessments: evaluating potential for planar, wedge or toppling failures in rock slopes
- Utility corridor planning: anticipating ground behaviour along long linear routes where discontinuities vary significantly

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Overview

BGS Civils: engineered fill identifies whether near-surface geological deposits across Great Britain are suitable for use as engineered fill and, if so, what use they are best suited for. Engineered fill is selected, placed and compacted to an appropriate specification in order that it will exhibit a required engineering behaviour. This dataset translates 1:50 000-scale geological mapping and engineering geology knowledge into a practical assessment distinguishing those deposits that are suitable for use as engineered fill from unsuitable deposits.

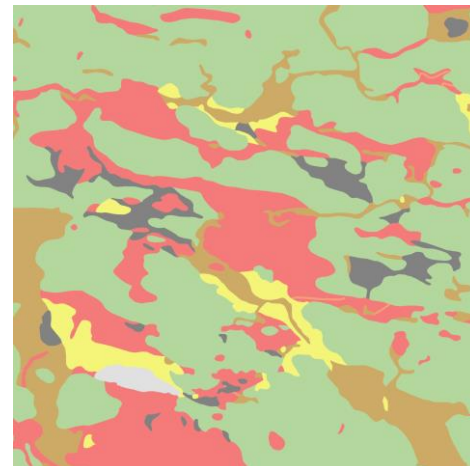
The dataset is part of the wider BGS Civils suite, which provides engineering-relevant geological intelligence for early-stage design, asset management and risk assessment.

Product benefits

- Better planning of earthworks, road bases and foundations where specific geotechnical properties are required
- Improved understanding of the fill-type characteristics of near-surface materials
- More accurate forecasting of material re-use potential and costings of material removal and disposal
- Consistent national-scale intelligence for feasibility and concept design, before intrusive investigation is available

Key features

- National coverage across Great Britain, aligned with BGS's geological mapping
- 1:50 000 scale (± 50 m)
- Classification of suitability for use as engineered fill, based on industry standards, considering:
 - geological material type
 - maximum particle size
 - presence of sulfate or readily oxidised sulfide
- GIS vector format for ease of geospatial analysis
- Consistent classification based on BGS's engineering geology expertise and geotechnical literature
- Part of the BGS Civils suite, which can be combined with datasets about geological materials and their engineering characteristics



Licencing

Indicative pricing for internal business use

BGS Civils bundle: £0.58

Individual layers: £0.35

Prices per km²

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

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Target markets

- Civil and geotechnical engineers
- Contractors
- Utility and infrastructure operators
- Local authorities and planners
- Environmental consultants

Challenges faced by customers

- Increasing cost of removing material off-site and especially disposal of unused material
- Difficulty assessing re-use potential: without indicative data, it is hard to plan whether excavated material can be re-used for engineered fill or must be disposed of

Use cases

- Highway and rail cuttings or embankments: understanding the suitability of geological materials for re-use in engineered linear earthworks
- Local development planning: identifying whether geological resources needed for development can be recycled on-site or need to be sourced from elsewhere
- Development contractors: estimating geological material disposal volumes and costs

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Overview

BGS Civils: excavatability classifies how difficult it is likely to be to excavate near-surface geological materials across Great Britain. It translates 1:50 000-scale geological mapping and engineering geology knowledge into practical excavatability classes that indicate whether ground can typically be removed by hand tools or mechanical excavators, or requires heavy breaking.

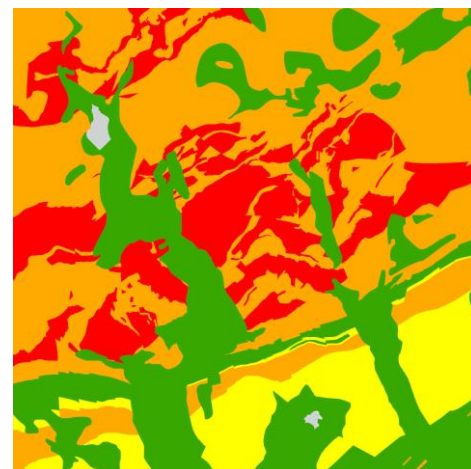
The dataset is part of the wider BGS Civils suite, which provides engineering-relevant geological intelligence for early-stage design, asset management and risk assessment.

Product benefits

- Better forecasting of plant requirements, from standard excavators to breakers or blasting
- More accurate programme and cost estimates for excavation works
- Early identification of hard or resistant materials that may slow construction
- Improved health and safety planning, reducing risks associated with unexpected hard ground
- More efficient cut and fill design, haulage planning and material management

Key features

- Excavatability classification, providing an assessment of the mode of equipment required to excavate based on the strength and density of deposits. These classifications are aligned to British Standard BS5930 and are assessed considering:
 - deposit type
 - weathering
 - the presence of discontinuities
- GIS vector format for ease of geospatial analysis
- Consistent classification based on BGS's engineering geology expertise and geotechnical literature
- Part of the BGS Civils suite, which can be combined with datasets about geological materials and their engineering characteristics



Licensing

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Prices per km²

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Target markets

- Civil and geotechnical engineers
- Contractors and construction planners
- Transport and utilities operators
- Local authorities and planners

Challenges faced by customers

- Unexpected hard ground conditions can cause delays and require specialist equipment
- Inaccurate early-stage cost estimates without indicative excavatability data
- Fragmented or inconsistent data on all factors influencing excavatability

Use cases

- Highway or rail corridor design: identifying sections where excavation will require heavy plant or breaking, improving programme planning
- Basement and foundation construction: anticipating whether excavation will encounter soft soils, stiff tills or competent rock
- Utility trenching: planning equipment needs and excavation rates for pipelines, cables and drainage systems
- Cut and fill earthworks: estimating excavation difficulty to optimise haulage, sequencing and material re use

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Overview

BGS Civils: foundation conditions assesses how near-surface geological materials across Great Britain are likely to behave as foundations for buildings and infrastructure. It translates 1:50 000-scale geological mapping and engineering geology knowledge into practical indicators of ground performance, including bearing capacity, settlement potential, strength and volume change potential.

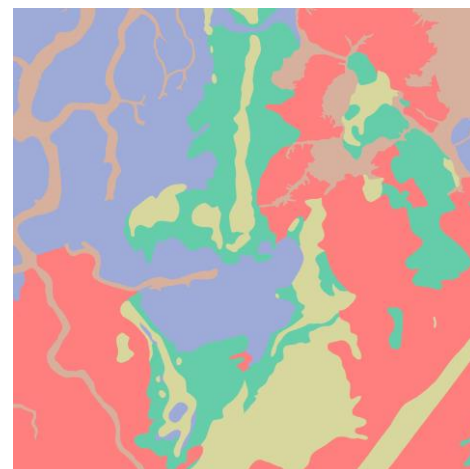
The dataset is part of the wider BGS Civils suite, which provides engineering-relevant geological intelligence for early-stage design, asset management and risk assessment.

Product benefits

- Early identification of ground that may cause excessive settlement or low bearing capacity
- Better planning for foundation type selection, such as shallow footings, rafts or piles
- More accurate cost and programme forecasting, reducing the likelihood of unexpected ground-related delays
- Improved risk management for developments in areas with variable or weak geology
- Consistent national-scale intelligence that complements site-specific geotechnical testing

Key features

- National coverage across Great Britain
- 1:50 000 scale (± 50 m)
- Foundation behaviour classification considering:
 - strength or bearing capacity
 - settlement (compressibility) and differential settlement
 - subsidence or collapse due to dissolution
 - weathering and alteration
 - volume change in clays during foundation excavation
 - aggressive ground conditions of soluble sulfate, sulfide, low pH or high chloride content
- GIS vector format for ease of geospatial analysis
- Consistent classification based on BGS's engineering geology expertise and geotechnical literature
- Part of the BGS Civils suite, which can be combined with datasets about geological materials and their engineering characteristics



Licensing

Indicative pricing for internal business use

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Individual layers: £0.35

Prices per km²

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Target markets

- Civil and geotechnical engineers
- Local authorities and planners
- Contractors and developers
- Asset owners

Challenges faced by customers

- Unexpected foundation failures or redesigns cause costly changes late in a project
- Limited early-stage ground information ahead of site investigation or land acquisition
- Fragmented or inconsistent data on all factors influencing foundation behaviour
- Differential settlement resulting from geological variation over short distances, creating uneven ground performance
- Regulatory requirements to provide evidence of ground suitability and risk mitigation

Use cases

- Land-use modelling: identifying areas where housing developments are more or less likely to require special foundation design
- Housing development feasibility: identifying whether specific foundation designs are more or less suitable, or whether alternatives are possible
- Ground investigation planning: understanding where ground conditions are impacting foundation design and will need exploratory investigation
- Cost modelling: estimating likely foundation complexity to inform early project budgets
- Retrospective assessment: supporting investigation of a developed site experiencing foundation issues

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Overview

BGS Civils: strength provides an indicative assessment of the likely strength of near-surface geological materials across Great Britain. It translates 1:50 000-scale geological mapping and engineering geology expertise into practical strength classes that reflect how soils, superficial deposits and weathered or unweathered rock are expected to behave under load or during excavation.

The dataset is part of the wider BGS Civils suite, which provides engineering-relevant geological intelligence for early-stage design, asset management and risk assessment.

Product benefits

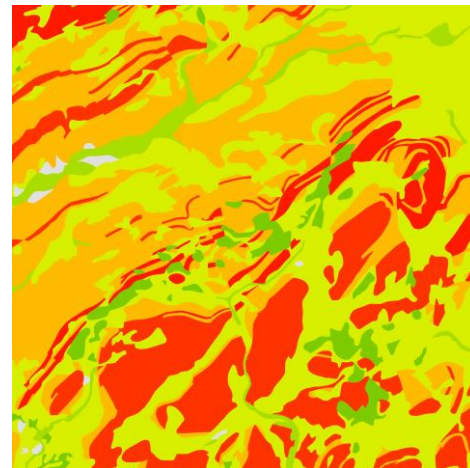
- Early identification of weak, strong or highly variable ground, improving design decisions
- Classification of the strength of coarse and fine soils or rocks, as defined by British Standard 5930
- More accurate cost and programme estimates, reducing the risk of unexpected ground-related delays
- Consistent national-scale intelligence that complements site-specific geotechnical testing

Key features

- National coverage across Great Britain
- 1:50 000 scale (± 50 m)
- Strength classification for soils, superficial deposits and rock, indicating likely engineering behaviour
- Definitions of the engineering strength of rocks and fine soils provided as minimum, maximum and typical strengths
- Definitions of the engineering strength of coarse soils provided as minimum, maximum and typical densities
- GIS vector format for ease of geospatial analysis
- Consistent classification based on BGS's engineering geology expertise and geotechnical literature
- Part of the BGS Civils suite, which can be combined with datasets about geological materials and their engineering characteristics

Target markets

- Civil, environmental and geotechnical engineers
- Developers and planners
- Contractors
- Transport and utilities infrastructure owners and operators



Licencing

Indicative pricing for internal business use

BGS Civils bundle: £0.58

Individual layers: £0.35

Prices per km²

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Challenges faced by customers

- Unexpected ground conditions can cause redesigns or delays
- Inaccurate early-stage cost estimates without indicative strength data
- Limited early-stage ground information ahead of site investigation
- Differential settlement resulting from geological variation over short distances, creating uneven ground performance

Use cases

- Foundation design feasibility: identifying whether ground strength is likely to support shallow foundations or require piling
- Earthworks planning: estimating the strength of materials to inform cut and fill design, compaction requirements and haulage planning
- Slope stability assessments: understanding how material strength influences the risk of slips or failures and the need for reinforcement
- Utility trenching: anticipating whether soils or weathered rock will require specific excavation methods or support
- Transport corridor planning: mapping strength variations along long linear routes to anticipate engineering challenges

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Overview

BGS Civils: sulfate/sulfide potential identifies where naturally occurring or anthropogenic sulfate and sulfide minerals in near-surface geological materials may pose a risk to buried concrete and other construction materials. It translates 1:50 000-scale geological mapping, geochemistry and engineering geology knowledge into practical domains indicating where ground conditions could generate aggressive chemical environments, such as direct sulfate attack on concrete or sulfide oxidation producing acidic pore-water conditions.

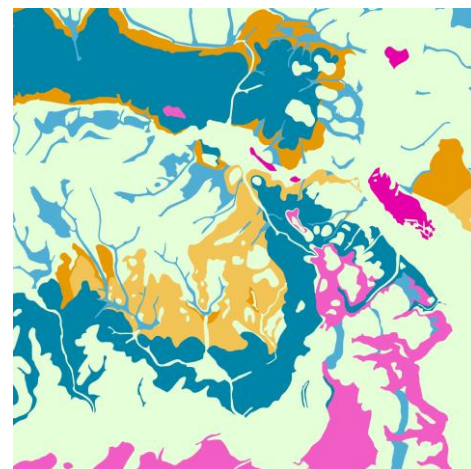
The dataset is part of the wider BGS Civils suite, which provides engineering-relevant geological intelligence for early-stage design, asset management and risk assessment.

Product benefits

- Early identification of sulfate-rich or sulfide-bearing ground that may attack concrete or steel
- Reduced risk of costly remediation, redesign or structural deterioration caused by chemical attack
- Improved environmental and safety management, especially where sulfide oxidation may generate acidic or expansive conditions
- Consistent national-scale intelligence that complements laboratory testing and site-specific geotechnical investigation

Key features

- National coverage across Great Britain
- 1:50 000 scale (± 50 m)
- Sulfate/sulfide potential classification, indicating the likelihood of aggressive chemical conditions based on the form and distribution of any sulfate or sulfide minerals in the ground
- Includes indications for the impact of weathering and leaching of ground materials
- GIS vector format for ease of geospatial analysis
- Consistent classification based on BGS's engineering geology expertise and geotechnical literature
- Part of the BGS Civils suite, which can be combined with datasets about geological materials and their engineering characteristics



Licencing

Indicative pricing for internal business use

BGS Civils bundle: £0.58

Individual layers: £0.35

Prices per km²

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Target markets

- Civil and geotechnical engineers
- Developers and planners
- Contractors
- Transport and utilities infrastructure owners and operators
- Environmental and geochemical specialists and hydrologists

Challenges faced by customers

- Unexpected sulfate attack on concrete causing expansion and cracking in buried concrete
- Oxidation of sulfides during excavation or material handling can generate acidic conditions, heave or aggressive groundwater
- Inaccurate early-stage material specifications without indicative sulfate/sulfide data
- Cost overruns and delays from redesigns, replacement of materials or requirements for additional protective measures
- Regulatory standards such as BRE SD1 require assessment of sulfate conditions before construction

Use cases

- Foundation and basement design: identifying whether sulfate-resistant concrete is required for footings, slabs or retaining walls
- Utility installation: assessing chemical risks to buried pipes, chambers and concrete surrounds
- Earthworks and cuttings: understanding whether excavation may expose sulfide-bearing materials to oxidation
- Transport corridor planning: mapping chemical ground risks along long linear routes to inform material selection and material handling regimes
- Environmental impact assessments: identifying potential for acid generation or aggressive groundwater conditions

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Overview

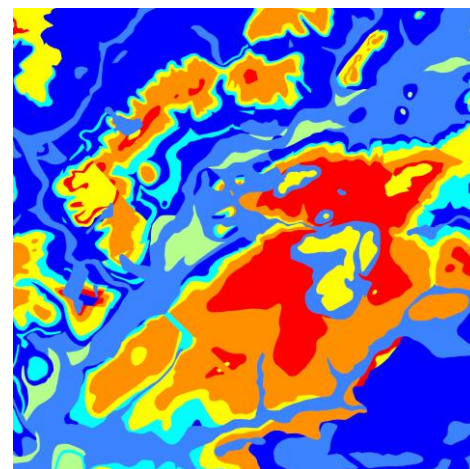
BGS's resistivity dataset presents modelled resistivity values for near-surface geological materials across Great Britain, which are verified by comparison with the National Resistivity Soundings Database and apparent resistivity estimates from airborne electromagnetic surveys. Resistivity is a measure of how strongly subsurface materials resist electrical currents, which is directly influenced by lithology, porosity, moisture content, salinity and degree of weathering.

Product benefits

- Early indication of typical ranges of resistivity to be expected in shallow geological materials
- Supports planning for installing new power equipment on undeveloped sites
- Improved estimations for site preparation and earthing equipment for new or redeveloped sites
- Consistent national-scale intelligence that complements geotechnical and geophysical investigation

Key features

- National coverage across Great Britain
- 1:50 000 scale (± 50 m)
- Modelled 20th, 50th and 80th centile values for resistivity of shallow geological materials
- GIS vector format for ease of geospatial analysis
- Simplified classification of materials based on BGS's engineering geology expertise
- Complementary to the BGS Civils suite, which can be combined with datasets about geological materials and their engineering characteristics



Licencing

Indicative pricing for internal business use

£0.35 per km²

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Target markets

- Civil and geotechnical engineers
- Power network engineers and connection providers
- Developers and planners
- Contractors
- Transport and utilities infrastructure owners and operators

Challenges faced by customers

- Unknown ground conditions at a new site with no way of estimating possible resistivities of ground materials
- Potentially high variance of resistivity in the shallow subsurface
- Limited information to allow costing of earthing design
- Cost overruns and delays from redesigns, replacement of materials or requirements for additional protective measures
- Market need for regional and national information beyond 'local installer' knowledge

Use cases

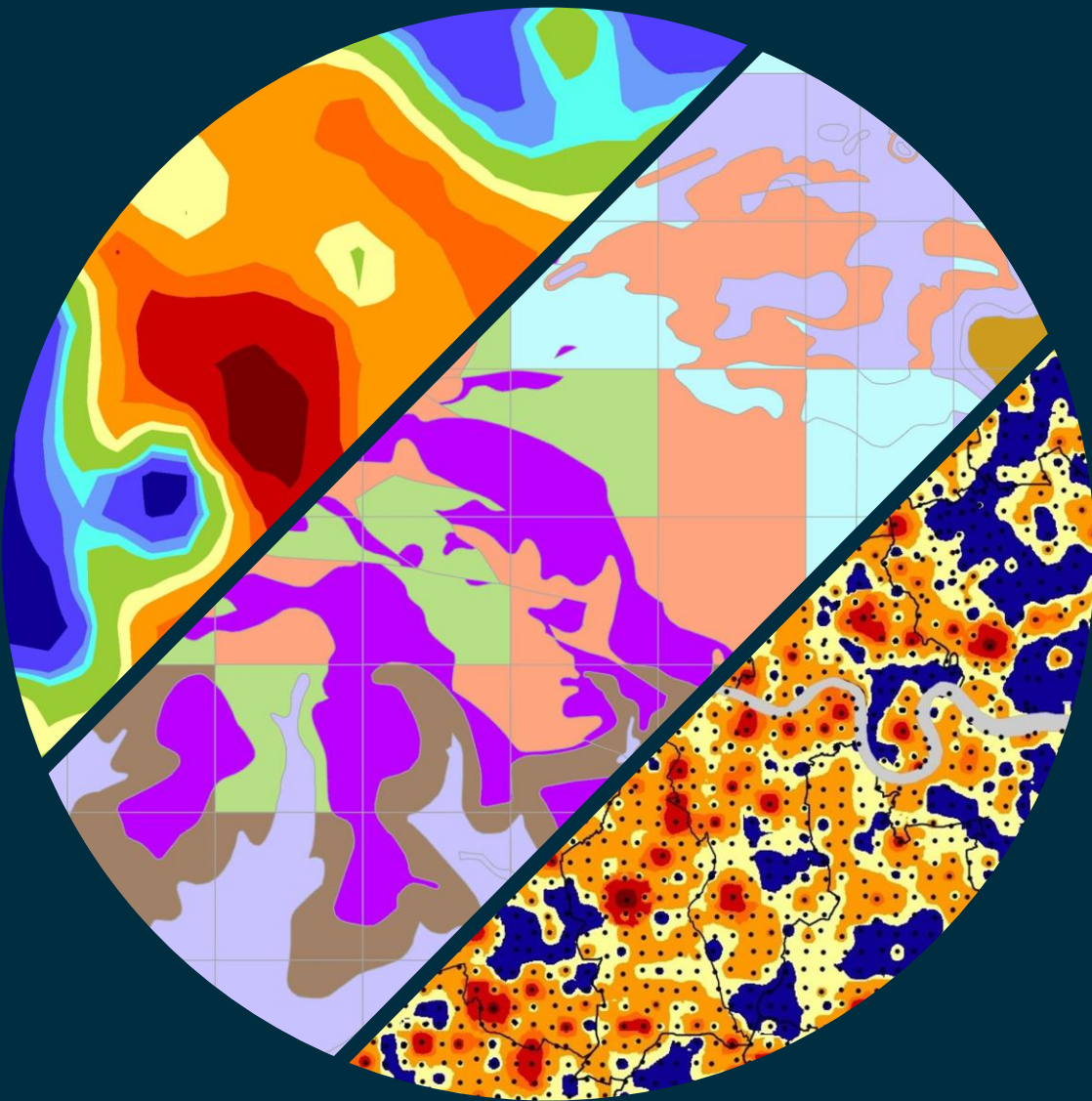
- Earthing and grounding design: identifying or confirming likely ranges of resistivity to be found in shallow subsurface prior to site visit
- Utility installation: assessing equipment and materials needs for untested locations
- Retrospective assessments: understanding whether ground conditions are subject to low resistivity or high conductivity conditions, posing a potential issue for stray currents and corrosion

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GEOCHEMISTRY

BGS's geochemistry products provide information on the chemical composition of soils and stream sediments in the UK.

These datasets include:

[UK stream sediment geochemistry](#) Comprehensive geochemical baseline mapping for the UK, based on systematic stream sediment sampling

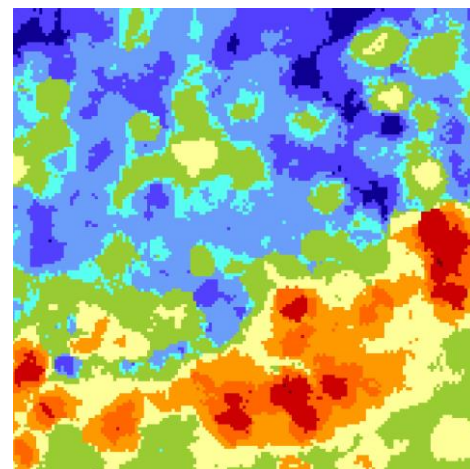
[UK topsoil geochemistry](#) Topsoil geochemical mapping providing an essential benchmark for assessing levels of inorganic elements in soil and their origins

[London Earth](#) High-resolution geochemical baseline mapping for topsoils across Greater London

[Soil chemistry for environmental assessments](#) Derived mapping that estimates natural background levels of potentially harmful elements in UK soil, providing high-resolution data of their distribution in 23 major urban areas

Overview

BGS's UK stream sediment geochemistry dataset models the chemical composition of stream sediments across the UK. Stream sediments act as natural collectors of material eroded from surrounding rocks and soils, providing an integrated picture of catchment-scale geochemistry. Concentrations of 18 major and trace elements, such as calcium, magnesium, cobalt and nickel, derived from 110 794 sediment samples from small streams across the UK, are interpolated to produce national element concentration maps. These offer a high-quality geochemical baseline with applications for environmental assessment, mineral exploration, land-use planning and pollution monitoring.



Product benefits

- A consistent national baseline for environmental monitoring and regulatory compliance
- Captures catchment-scale geochemical signatures, helping identify natural and anthropogenic sources of elements such as metals
- Evidence for mineral prospectivity, as stream sediments can highlight geochemical anomalies linked to mineralisation
- Support for pollution detection, especially downstream of industrial, mining or agricultural areas
- High-quality, laboratory-verified data that improves the accuracy of environmental modelling and risk assessments
- A complementary dataset to soil and water geochemistry, enabling multi-evidential approach to environmental analysis

Key features

- National coverage across the UK with systematic sampling of stream sediments
- Modelled element concentrations provided for 18 key elements as wt% or mg/kg, with supporting standard deviation values as an indicator of associated uncertainty
- Geochemical predictions on a regular 500 × 500 m grid with supporting information on regional sample density and appropriate scale of use
- GIS raster formats supporting geospatial analysis with an image atlas available for reference
- In addition to the 18 elements presented as national maps, baseline stream sediment data is available for a more extensive suite of elements with incomplete national coverage
- Baseline values that help distinguish natural geochemical patterns from contamination in stream sediments

Licensing

Gridded data is available for commercial, research and public use under [Open Government Licence](#).

Underpinning survey point data is available under licence on request. There is no charge for this data, but it is subject to a data preparation fee.

Please [get in touch](#) (digitaldata@bgs.ac.uk) for more information.

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- > [Metadata](#)

Target markets

- Environmental consultants
- Regulators and environmental protection agencies
- Local authorities and planners
- Researchers studying geochemistry, pollution pathways and catchment processes
- Water industry professionals
- Conservation and ecology organisations

Challenges faced by customers

- Difficulty distinguishing natural geochemical signatures from contamination, especially in areas with historic mining
- Lack of consistent catchment-scale data, making it hard to interpret sediment sample analyses
- Regulatory pressure to demonstrate compliance with environmental standards for water and sediment quality
- Uncertainty in mineral exploration, where geochemical indicators are essential for early-stage reconnaissance
- Fragmented or outdated local datasets, which may not reflect current environmental conditions
- Challenges in assessing ecological and human health risks without robust geochemical context

Use cases

- Pollution tracing: identifying elevated metal concentrations downstream of industrial sites, landfills or abandoned mines
- Mineral exploration: detecting geochemical anomalies that may indicate mineralisation in upstream catchments
- Catchment management: supporting river-basin planning and water-quality assessments
- Environmental impact assessments: baseline data for developments near rivers and streams
- Long term monitoring: tracking changes in sediment chemistry due to land-use change or remediation
- Academic study: sediment transport, geochemical cycling and environmental change research

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Overview

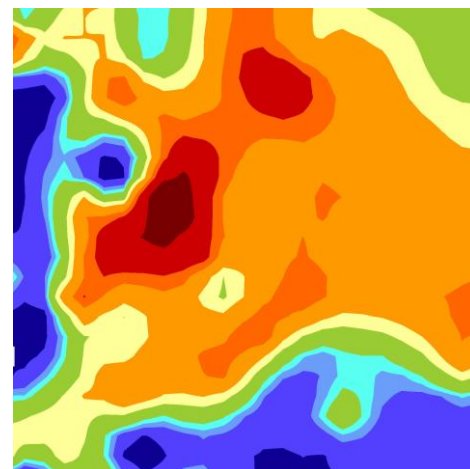
BGS's UK topsoil geochemistry dataset maps the chemical composition of topsoil across the UK. It provides concentrations of 41 major and trace elements derived from geochemical analyses of 57 966 topsoil samples, which were collected between 1978 and 2014 across England, Wales, Northern Ireland and part of Scotland. The dataset establishes a comprehensive and robust geochemical baseline, helping users understand natural soil chemistry, identify contamination and support environmental planning and land-management decisions.

Product benefits

- Offers a consistent baseline against which contamination, land-use change and regulatory compliance can be evaluated, supporting environmental assessment
- Provides nationally consistent baseline geochemical data, essential for benchmarking site-specific studies against the geochemical background
- Reliable evidence for contaminated land assessments, environmental permitting and planning applications based on topsoil analyses with comprehensive coverage
- Assists in land-use planning, redevelopment and agricultural management by identifying areas with elevated or unusual soil chemistry

Key features

- Coverage of England, Northern Ireland, Wales and part of Scotland with systematic sampling
- Element concentrations derived from X-ray fluorescence spectrometry of topsoil samples provided as wt% or mg/kg, with supporting prediction standard error values
- Geochemical predictions on a regular 500 × 500 m grid with supporting information on regional sample density and appropriate scale of use
- GIS raster formats supporting geospatial analysis with an image atlas available for reference



Licensing

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Further information

- > [Web page](#)
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- > [Open data](#)
- > [Metadata](#)

Target markets

- Environmental consultants
- Local authorities and planners
- Environmental regulators
- Public health agencies
- Agricultural and land-management professionals

Challenges faced by customers

- Lack of consistent baseline data, making it hard to compare sites or assess long-term trends
- Regulatory pressure to demonstrate compliance with environmental standards
- Fragmented or outdated local datasets, which may not reflect current conditions
- Challenges in assessing ecological and human health risks without robust geochemical context

Use cases

- Agricultural land management: understanding nutrient levels and trace element distribution to guide soil improvement strategies
- Environmental monitoring: tracking long-term changes in soil chemistry due to industry, transport or atmospheric deposition
- Ecosystem risk assessment: evaluating whether soil chemistry poses risks to vegetation, wildlife or water bodies
- Public health studies: mapping areas with elevated lead or arsenic to support targeted interventions

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Overview

BGS's London Earth is a high-density geochemical survey of topsoil across Greater London. It represents the world's largest systematic geochemical mapping of an urban area, with 6288 sampling locations across the Greater London Authority area. The dataset provides concentrations of more than 50 inorganic chemical elements in topsoil, measured using X-ray fluorescence spectrometry.

Product benefits

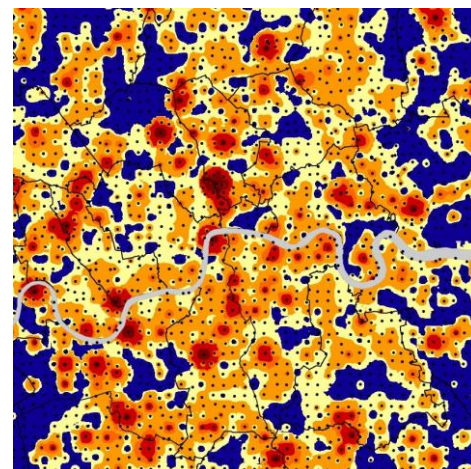
- Provides baseline geochemical values that contextualise site-specific investigations
- Supports environmental assessments, urban planning, public health research and contaminated land management
- Identifies patterns of natural vs. human-derived chemical variation across the city
- High-quality, laboratory-verified data that improves the accuracy of environmental modelling and risk assessment

Key features

- High sampling density: about four samples collected per km² across the Greater London Authority area, a much greater density than for national rural sampling
- Multi-element analysis: more than 50 inorganic elements measured via X-ray fluorescence spectrometry, with resultant analytical data available to licence
- PDF sample maps of concentrations of 10 environmentally sensitive elements available to download
- Consistent, unbiased sampling methodology across the entire city
- Baseline dataset suitable for comparison with future surveys or site-specific investigations
- Reflects both geology and anthropogenic influences, enabling nuanced interpretation

Target markets

- Environmental consultants
- Urban planners and local authorities
- Public health researchers
- Geochemists and academic researchers
- Developers and engineering firms



Licensing

PDF geochemical maps and short interpretations for a selection of ten environmentally sensitive elements are available for commercial, research and public use under [Open Government Licence](#).

Underpinning survey point data is available under licence on request. There is no charge for this data but is subject to a data preparation fee.

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Further information

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Challenges faced by customers

- Lack of reliable baseline soil chemistry data for London
- Difficulty distinguishing natural vs. anthropogenic contamination without a consistent reference dataset
- High cost of unnecessary remediation due to limited contextual geochemical information
- Fragmented or inconsistent sampling approaches in previous local studies

Use cases

- Contaminated land assessments: using baseline element concentrations to determine whether elevated levels are unusual or expected for the area
- Urban redevelopment planning: screening soil chemistry before construction or remediation
- Health and exposure studies: investigating links between soil chemistry and public health outcomes
- Environmental monitoring: tracking long-term changes in soil chemistry across London

Contact

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Overview

BGS's soil chemistry for environmental assessments dataset provides key information for evaluating the presence of potentially harmful elements (PHEs), including arsenic, cadmium, chromium, copper, nickel, lead, tin and zinc, in topsoils across Great Britain. The presence of PHEs in soil can have implications for the health of residents, safety and the value of property, especially in relation to development.

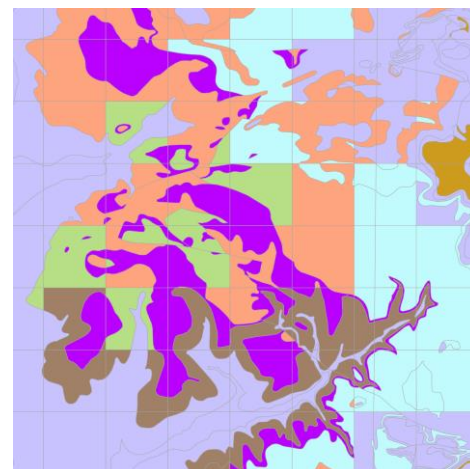
Product benefits

- Assists land-use and redevelopment planning to identify where elevated soil PHE concentrations may be a concern
- Can be applied to distinguish between natural background levels of PHEs in soil and those caused by anthropogenic contamination, reducing uncertainty in site investigations
- Supports regulatory compliance, including planning conditions, environmental permitting and contaminated land assessments
- Informs risk assessment for human and ecosystem health

Key features

Three GIS map layers in vector format for ease of geospatial analysis, with higher-resolution mapping that provides additional context in urban areas.

- Estimated ambient background soil chemistry:
 - modelled estimates of arsenic, cadmium, chromium, copper, nickel, lead, tin and zinc concentrations based on measurements from BGS rural soil and stream sediment geochemical baseline samples
 - reflecting 'ambient' (predominantly geogenic or natural) soil composition, allowing natural geochemical patterns to be distinguished from artificial contamination
 - national coverage across Great Britain
- Measured urban soil chemistry:
 - locations and measured concentrations of PHEs in individual soil samples collected by BGS geochemical surveys in 23 major UK urban areas, collected at a density of four samples per square kilometre
- Estimated urban soil chemistry:
 - interpolated estimates of PHE concentrations and bioaccessibility levels for arsenic and lead across 23 major UK urban areas, derived from interpolation of the measured urban topsoil data



Licensing

Indicative pricing for internal business use

All elements: £1.36

Single elements: £0.35

Prices per km²

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

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[> User guide](#)

[> Sample data](#)

[> Metadata:](#)

[> Ambient background](#)

[> Measured urban](#)

[> Estimated urban](#)

[> Scotland](#)

Target markets

- Environmental consultants
- Local authorities and planners
- Developers and landowners
- Environmental regulators
- Public health agencies

Challenges faced by customers

- Difficulty determining natural vs. artificial PHE concentrations in soil, especially in urban or industrial areas
- Lack of consistent background data, making it hard to interpret local measurements of PHEs in soil
- Regulatory pressure to demonstrate that soils meet environmental standards
- Uncertainty in redevelopment projects, where soil chemistry can impact remediation costs and feasibility
- Challenges in assessing ecological and human health risks without geochemical information

Use cases

- Pre-development site investigations: assessing whether concentrations of elements at a site are likely to fall within the 'normal' level prior to site investigation, and to provide context to aid the interpretation of site investigation results
- Contaminated land assessment: comparing PHE concentrations in locally collected soil samples with ambient background values, to identify abnormal concentrations of PHEs and verify whether sites are likely to be contaminated
- Planning and redevelopment: screening brownfield sites for potential contamination before design and construction, identifying whether further assessments are likely to be necessary
- Human health risk assessment: in situations where elevated concentrations of PHEs in topsoil at a site are measured to exceed soil guideline values, the dataset allows it to be resolved as to whether these exceedances reflect naturally high (geogenic) levels of a PHE, or if they reflect the presence of anthropogenic pollution and land contamination

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HAZARDS

BGS's hazard products offer assessments of susceptibility to ground stability hazards considering natural ground movement, ground movement associated with historic mineral workings, property receptor characteristics and climate change.

Geochemical hazard products assess where natural radioactive gases may occur in elevated concentrations, aligned to UK legislation.

Hydrogeological hazard products provide information on susceptibility to groundwater flooding, river erosion and geological indicators of past flooding.

Coastal hazard products provide an assessment of the vulnerability of the UK coastline to coastal change, flooding and erosion by combining geological, geomorphological and coastal process information.

These datasets include:

[GeoCoast](#) Assessment the vulnerability of the coastline of Great Britain to coastal change, flooding and erosion

[GeoClimate shrink-swell](#) Projected future change in susceptibility of clay shrink-swell ground movement due to climate change

[Geological indicators of flooding](#) Identification of landforms and sediments created by past flood events

[GeoScour](#) Assessment of susceptibility of river channels and adjacent land to erosion

[GeoSure[®]](#) Assessment of natural susceptibility of geological deposits to potential ground movement

[GeoSure® debris flow susceptibility model](#) Assessment of natural susceptibility to debris flows (a type of landslide)

[GeoSure® insurers and lenders product](#) Assessment of potential financial loss from natural ground movement on low-rise buildings

[GeoSure® shrink-swell 3D for London](#) Modelled assessment of the 3D distribution and behaviour of shrink-swell clays beneath London

[Groundwater flooding](#) Assessment of where geological conditions could enable groundwater flooding at the surface

[Mining hazard \(not including coal\)](#) Assessment of where past underground non-coal mining may have occurred and the potential for associated ground instability

[Property subsidence assessment](#) A shrink-swell subsidence susceptibility assessment considering building characteristics and tree proximity

[Radon potential](#) Assessment of the likelihood that radon gas will be present at elevated levels

Overview

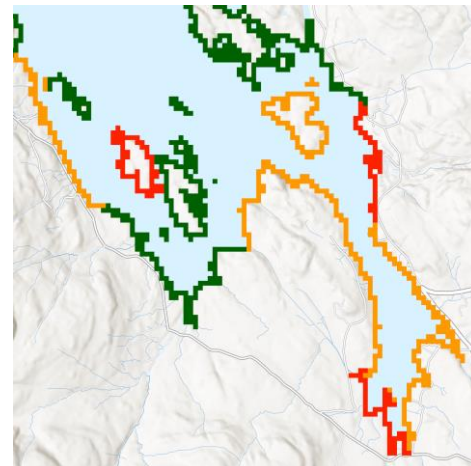
BGS's GeoCoast dataset assesses the vulnerability of the coastline of Great Britain to coastal change, flooding and erosion by combining geological, geomorphological and coastal processes information. The data offers assessments of susceptibility to inundation, coastal erosion, subsidence and groundwater flooding, as well as coastal morphology classification. It provides an evidence-based understanding of how coastal areas may respond to rising sea levels, storm surges and long-term coastal evolution, and has been designed to integrate with shoreline management plan areas.

Product benefits

- Provides a consistent national framework for understanding coastal vulnerability
- Offers insight into how geology influences erosion rates, stability and coastal response
- Evidence to support coastal planning, adaptation strategies and climate resilience assessments
- Identifies areas where infrastructure, communities or habitats are situated on or behind vulnerable coastlines
- A tool for early-stage screening before commissioning detailed coastal process modelling
- Data aligns to shoreline management planning regions, supporting policy and shoreline management planning, where geological context is essential

Target markets

- Coastal planners and local authorities
- Environmental and engineering consultants
- Infrastructure owners
- Shoreline management plan teams and coastal partnerships
- Insurers and risk analysts
- Conservation organisations and ecologists



Licencing

Indicative pricing for internal business use

Coastal grid data:

£936.85 per shoreline management plan

£22 072.33 for national coverage

Coastal erosion data:

£255.50 per shoreline management plan

£6018.55 for national coverage

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Key features

- National coverage across Great Britain
- 1:50 000 scale (± 50 m), providing coastal assessments every 50 m along the coastline of Great Britain
- Coastal properties grid, covering the foreshore and backshore, provides information on:
 - foreshore type, properties and area
 - backshore type, properties and area
 - coastal erosion susceptibility along high-water line
 - cliff profile from high-water to cliff top (slope angle; distance; cliff height)
 - coastal subsidence potential, based on satellite measurements and lithology type
 - inundation under climate change scenarios (future sea-level rise: 2020 (baseline); 2050; 2080; 2100): maximum flood extents as defined by UKCP18 sea-level rise climate scenarios
 - combined assessment of coastal inundation (not including UKCP18 scenarios) and groundwater flooding susceptibility, identifying areas of combined hazard
- Coastal erosion susceptibility assessment of the 'stack' of deposits that make up cliffs and coastal fronts, considering:
 - the strength of coastal deposits
 - discontinuities within coastal deposits
 - the permeability of coastal deposits
- Erosion susceptibility is scored (1 to 100) and classified into five susceptibility classes (low to high)
- Erosion susceptibility classes and scores for:
 - average susceptibility of the coastal deposit sequence
 - worst susceptibility score within the coastal deposit sequence
 - susceptibility of the base of the coastal deposit sequence (most likely to interact with waves)
- NCERM (2019) data included for England
- Classification of coastal vulnerability based on geology, geomorphology and coastal processes
- GIS vector format for ease of geospatial analysis, with attribution attached to a 50 m grid
- Consistent methodology, enabling comparison across regions and shoreline management plan boundaries
- Accompanying open data provides statistical summaries of the Premium GeoCoast data per shoreline management plan or local authority coastline
- Open access to coastal domains dataset, which identifies similar sections of the coast to support comparison and sharing of best practice at a regional scale and streamlines the underlying premium datasets into a simple, high-level scheme
- Domains are based on:
 - susceptibility of the coastline to erosion
 - presence or absence of a buffer between direct wave action
 - coastline geology
 - height and profile shape of the coastline

Challenges faced by customers

- Uncertainty about long-term coastal change, especially with accelerating sea-level rise
- Limited integration of geology into coastal risk assessments, which often focus only on hydrodynamics
- Fragmented or inconsistent datasets with regional inconsistencies, making national comparison difficult
- Regulatory pressure to demonstrate coastal resilience in planning and permitting
- High costs associated with unexpected erosion, cliff instability or coastal flooding
- Difficulty in predicting how different coastal landforms (for example, cliffs; dunes; estuaries) will respond to storms or climate change

Use cases

- Coastal risk screening: identifying vulnerable stretches of coastline for planning or investment decisions
- Shoreline management plans: providing geological context for 'hold the line', 'managed realignment' or 'no active intervention' policies
- Infrastructure planning: assessing erosion or flooding risk for railways, roads, pipelines or energy assets
- Climate-adaptation strategies: understanding how different coastal types may respond to sea-level rise
- Environmental impact assessments: evaluating how developments may interact with dynamic coastal systems
- Habitat management: supporting conservation of dunes, salt marshes and other coastal ecosystems sensitive to change
- Dynamic coastal change modelling: baseline data providing geological context within coastal change models

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Overview

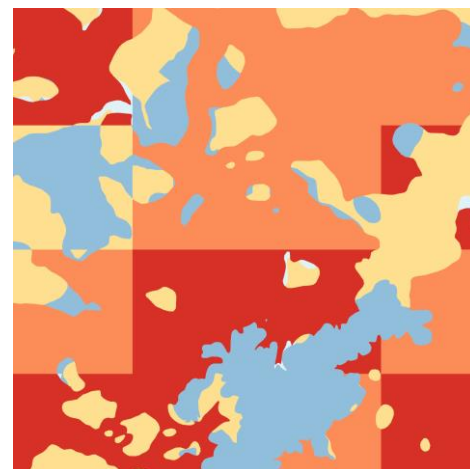
BGS's GeoClimate shrink–swell dataset provides information on the projected future change in susceptibility of clay shrink–swell ground movement across Great Britain due to climate change. It integrates BGS's 1:50 000-scale geological mapping with CHES-SCAPE's climate projections (derived from UKCP18 from the [UK Centre for Ecology & Hydrology](#) (UKCEH)) to model future soil-moisture deficit as an indicator for susceptibility to shrink–swell subsidence. The dataset predicts where hazard susceptibility is likely to change under three climate changes scenarios, based on Representative Concentration Pathways (RCP) 2.6, 4.5 and 8.5, and for three time periods (2030; 2050; 2070). A modelled baseline period is included to support change analysis.

Product benefits

- Provides forward-looking hazard intelligence for one of Britain's most costly geohazards (approx. £3 billion cost to UK economy in the last decade)
- Helps organisations anticipate climate-driven increases in subsidence risk, enabling proactive climate change adaptation
- Offers consistent national coverage with scientifically robust climate modelling and geological inputs
- Multiple climate scenarios and future time periods support bespoke assessments to meet user-specific requirements
- Aligned to regulatory standards for climate change adaptation

Key features

- National coverage across Great Britain (excluding some Scottish islands)
- 1:50 000 scale (± 50 m)
- Five-class rating system of likelihood for susceptibility to increase, from highly unlikely to extremely likely
- GIS vector format for ease of geospatial analysis
- Integration of highest available resolution UK climate change projections from expert climate modeller UKCEH
- Outputs provided for RCPs 2.6, 4.5 and 8.5, aligned with regulatory requirements for financial stress testing and climate adaptation planning
- Three future time periods provided; 2030s, 2050s and 2070s
- Average, wetter and drier projected climate conditions are provided for each RCP/time period combination, to allow users to consider average, best- and worst-case scenarios
- Difference maps show the change relative to a modelled historic baseline to support change analysis
- Periodically updated to incorporate new geological information, improved mapping and updated climate projections



Licencing

Indicative pricing for internal business use

£0.45 per km² for commercial use.

Bundle price: GeoClimate shrink–swell plus GeoSure® shrink–swell £0.60 per km²

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

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Target markets

- Insurers and risk analysts
- Banks and mortgage lenders
- Environmental regulators
- Infrastructure owners and operators
- Civil, environmental and geotechnical engineers
- Conveyancing reporters

Challenges faced by customers

- Increases in subsidence insurance claims due to hotter, drier summers and increased rainfall variability
- Regulatory pressures to provide evidence-based climate change adaptation policy plans
- Uncertainty about how climate change will affect ground stability at regional and local scales
- High costs associated with reactive repairs, insurance impacts and infrastructure disruption
- Difficulty integrating climate projections with geological susceptibility

Use cases

- Financial portfolio stress testing: banks, lenders and insurers must test their portfolios for resilience to climate change risks
- Infrastructure planning: identifying buried and built infrastructure corridors likely to experience increased ground movement to mitigate impacts
- Local planning policy: integrating future shrink–swell susceptibility into development control
- Asset maintenance scheduling: prioritising inspections in areas where susceptibility is projected to increase
- Network resilience assessment: identifying areas of increasing susceptibility to support adaptation planning and budgeting
- Climate adaptation strategies: designing foundations or drainage systems that are resilient to future soil moisture extremes

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Overview

BGS's geological indicators of flooding dataset identifies landforms and sediments created by past flood events. These geological features, such as alluvial deposits, river terraces, floodplain sediments and coastal storm-wash deposits, provide evidence of where flooding has occurred historically over long timescales. Because geology records events far beyond the period of instrumental or historical data, the dataset offers a long-term perspective on flood susceptibility across Great Britain.

Product benefits

- Reveals long-term flood patterns that are not captured in modern flood-risk maps
- Helps identify areas where flooding has occurred repeatedly over centuries or millennia
- Supports planning and development decisions by highlighting flood-prone landforms
- Provides evidence for catchment and coastal management, complementing hydrological models
- Helps organisations understand multi-source flood risk, including river and coastal processes

Key features

- National coverage across Great Britain
- 1:50 000 scale (± 50 m)
- Identification of flood-related landforms, including alluvium, river terraces, floodplain deposits and coastal storm deposits
- Differentiation between deposits that represent areas with a high potential to flood ('Zone 1') and deposits representing areas susceptible to flooding in more extreme events such as very heavy and prolonged periods of rainfall or extreme storm surges ('Zone 2')
- Long-term flood evidence, extending far beyond recorded flood history
- GIS vector format for ease of geospatial analysis
- Designed to complement hydrological and flood model datasets, offering a multi-layered view of flood risk



Licencing

Indicative pricing for internal business use

£0.35 per km²

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Target markets

- Local authorities and planners
- Environmental regulators
- Environmental and engineering consultants
- Transport and utilities infrastructure owners
- Catchment and coastal managers
- Insurers and risk analysts assessing long-term flood susceptibility
- Researchers studying floodplain evolution, geomorphology and climate impacts
- Developers and landowners

Challenges faced by customers

- Limited historical flood data, especially in rural areas or before modern monitoring began
- Difficulty identifying long-term flood susceptibility, which hydrological models alone cannot show
- Regulatory pressure to demonstrate long-term flood resilience in planning applications
- Increasing climate-driven extremes, making long-term flood context more important

Use cases

- Planning applications: screening sites for long-term flood susceptibility before design begins
- Flood risk assessments: incorporating geological evidence to complement hydrological modelling
- Infrastructure planning: identifying routes vulnerable to floodplain inundation or coastal storm deposits
- Catchment management: understanding how rivers have historically migrated or overtopped their banks
- Coastal resilience: mapping areas affected by storm deposits
- Environmental impact assessments: evaluating how developments may interact with flood-formed landforms

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Overview

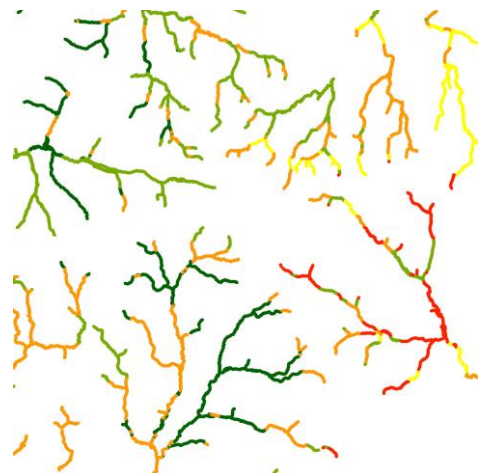
BGS's GeoScour dataset assesses the susceptibility of river channels and adjacent land to scour — the process by which flowing water erodes riverbeds and banks. It combines geomorphology, hydrology, topography and geological information to classify how likely different parts of the river network are to experience scour.

Three tiers of data provide differing scales of erosion assessment, catering to all stakeholders.

- Tier 1: a summary overview of the catchment characteristics
- Tier 2: subcatchment-scale summaries of key characteristics, including:
 - erosion susceptibility
 - flood accommodation capacity
 - geological run-off potential
 - catchment morphology
- Tier 3: information for individual stretches of river:
 - geological properties of the riverbed and banks, such as percentage of reach classed as bedrock, strength and composition of that bedrock
 - river morphology classifiers
 - susceptibility to erosion of both the superficial and bedrock deposits that make up the riverbed
 - susceptibility to lateral erosion, that is, susceptibility of the riverbank material to erosion

Key features

- National coverage across Great Britain's river network
- Tier 3 is 1:50 000 scale (± 50 m) and aligns to the OS Open Rivers Watercourse dataset for easy integration with other riverine datasets
- Open access to data for tiers 1 and 2
- GIS vector format for ease of geospatial analysis
- Scour susceptibility classification based on geomorphology, hydrology, geology and topography
- Provision of the average, best- and worst-case erosion susceptibility classes per river reach to convey the variation and heterogeneous behaviour of geological deposits and to allow the user to consider both end members for scour potential according to their needs
- Consistent methodology, enabling comparison across catchments and regions
- Designed for early-stage assessment, complementing site-specific hydraulic or geotechnical studies



Licencing

Indicative pricing for internal business use

Tier 3 priced per catchment based on river length

Band 0.5 (catchment with river length less than 500 km):
£56.78

Band 1 (catchment with river length less than 500 km):
£113.56

Band 2 (catchment with river length between 500 and 1400 km) : £227.12

Band 3 (catchment with river length greater than 1400 km):
£340.67

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Further information

[See overleaf](#)

Target markets

- Transport and utilities infrastructure owners and operators
- Flood and erosion risk modellers
- Civil, environmental and geotechnical engineers
- Local authorities and planners
- Water industry professionals
- Researchers studying river processes and sediment dynamics
- Environmental agencies

Product benefits

- A nationally consistent assessment of scour susceptibility for rivers and floodplains
- Multi-tier offering allows for assessments at different scales
- Evidence to support infrastructure design, maintenance and resilience planning, especially for bridges, pipelines and transport corridors
- Insight into geomorphological factors that influence erosion, sediment transport and channel stability
- Support for flood-risk management, as scour often intensifies during high flow events
- A way to integrate geological and geomorphological intelligence into asset management systems and environmental assessments

Challenges faced by customers

- Limited sediment-supply proxy data for river erosion modelling
- Increasing climate-driven extremes, which intensify erosion and channel instability
- High maintenance and repair costs when scour is not identified early
- Regulatory and safety pressures requiring evidence-based assessment of river-related hazards
- Difficulty predicting channel behaviour, especially in complex or geologically diverse catchments

Use cases

- Bridge/culvert design: identifying where scour potential requires additional design considerations
- Flood risk assessments: assessing where erosion may alter channel capacity or redirect flow
- Asset management prioritisation: targeting inspections and maintenance
- Catchment management: supporting river restoration or erosion control strategies
- Emergency response planning: identifying vulnerable assets during extreme rainfall or flooding

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Further information

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Overview

BGS's GeoSure® assesses the natural susceptibility of geological deposits to potential ground movement resulting from six key natural geohazards. It converts geological and geotechnical knowledge into hazard classes that indicate potential for the ground to cause stability problems for buildings, infrastructure and buried assets.

Collapsible deposits: some deposits can undergo a reduction in volume if loaded or saturated, resulting in collapse and subsidence.

Compressible ground: some deposits contain fluids that can be squeezed out when a load is applied or groundwater levels change, resulting in a reduction in ground volume and causing ground movement.

Landslides: different geology types and topographical settings can combine to increase the susceptibility to downslope ground movement (landslides), causing damage through loss of support to overlying or buried structures, or from direct impact.

Running sand: some deposits contain sandy layers that can become fluidised by water flowing through them, which removes support for overlying structures and results in subsidence.

Shrink-swell subsidence: clay-rich deposits that absorb water when wet and lose water when drying increase and decrease in volume as they do so. This volume change causes seasonal movement of the ground upwards (heave) or downwards (subsidence).

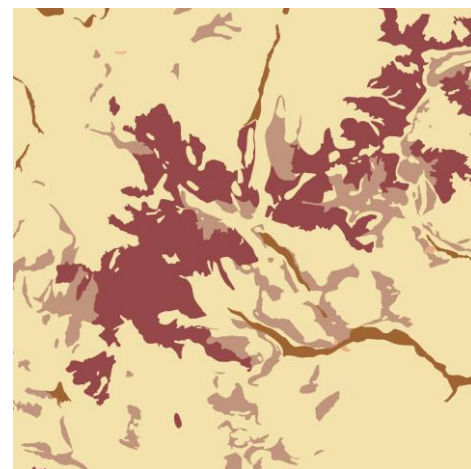
Soluble rocks: some deposits dissolve in water, resulting in underground cavities that can collapse and cause ground movement, or fill with sediment, which can later be washed out due to changes in groundwater or surface water and can result in ground movement.

Product benefits

- Identifies ground related risks early, before intrusive investigation or design work begins
- Supports planning and development control, ensuring ground conditions are considered in land-use decisions
- Improves infrastructure resilience, especially for utilities and transport networks exposed to ground movement
- Reduces the likelihood of unexpected ground failures, which can be costly and disruptive
- Provides evidence for insurance and risk modelling, particularly for subsidence and landslide risk

Target markets

- Local authorities/planners
- Civil, environmental and geotechnical engineers
- Utility companies
- Transport operators
- Insurance, lenders and risk analysts
- Conveyancing reporters
- Developers and landowners



Licencing

Indicative pricing for internal business use

All six themes: £0.91

Collapsible deposits: £0.06

Compressible ground: £0.23

Landslides (including debris flow): £0.35

Running sands: £0.23

Shrink-swell: £0.35

Soluble rocks: £0.18

(Prices per km² and subject to number of users, licence fee and data preparation fee.)

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Access via a BGS data re-seller

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Further information

[See overleaf](#)

Key features

- Six ground instability hazards mapped with national coverage
- 1:50 000 scale (± 50 m)
- Five-class hazard rating system, from very low to very high susceptibility
- BGS GeoReports are available for site-specific queries
- GIS vector format for ease of geospatial analysis
- Bespoke methodology per hazard, ensuring accurate assessment of ground movement potential
- Derived from authoritative BGS geological mapping and geotechnical data
- Periodically updated to incorporate new geological information and improved mapping
- Designed for early-stage assessment, complementing (but not replacing) site-specific investigation
- Open access available for a generalised, low-resolution version of the data

Challenges faced by customers

- Unexpected ground movement causing damage, delays or redesigns to built and buried assets
- Expertise required to interpret local geological conditions for potential ground hazards
- Increasing regulatory requirements for ground stability evidence in planning applications
- Insurance exposure, particularly in areas prone to shrink-swell or landslides
- High costs to mitigate or repair unstable ground post-construction

Use cases

- Local development: screening planning applications for ground stability constraints
- Planning proposals: evidencing mitigation strategies in engineering and development proposals
- Network analysis: identifying landslide susceptibility along proposed road, rail or pipeline routes
- Claims analysis: supporting insurance underwriting for ground subsidence
- Portfolio resilience assessment: assessing financial portfolios for exposure to geohazards
- Property transactions: reporting potential hazards to properties during conveyancing searches
- Infrastructure management: prioritising asset maintenance in areas prone to ground movement

Contact

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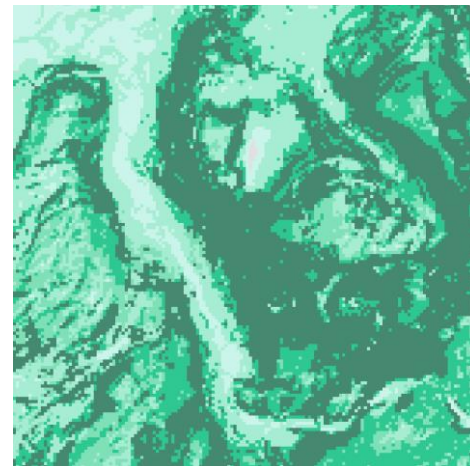
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- > [User guide](#)
- > [Sample data](#)
- > [GeoReports online shop](#)
- > [Open data](#)
- > [Metadata](#)

Overview

BGS's GeoSure® debris flow susceptibility model identifies areas in Great Britain with the potential to initiate a debris flow. A debris flow is a rapid, downslope flow of poorly sorted debris mixed with water. These flows are a widespread phenomenon in mountainous terrain and are distinct from other types of landslides as they can occur periodically on established paths. The data evaluates natural geological, hydrogeological and geomorphological conditions to identify potential source areas.

The dataset is part of the wider BGS GeoSure® suite, which provides an assessment of the natural susceptibility of geological deposits to potential ground movement.



Product benefits

- Understanding where natural slopes may generate debris flows
- Supports risk reduction, resilience planning and asset protection for infrastructure, utilities and property
- Enables early-stage hazard screening before commissioning detailed site investigations
- Reduces the likelihood of unexpected slope failures, which can be costly and disruptive
- Provides evidence for risk modelling, particularly for transport infrastructure

Key features

- National coverage across Great Britain
- 1:50 000 scale (± 50 m)
- GIS raster format with a 50 m cell size, for ease of geospatial analysis
- Identification of potential debris flow source areas (rather than run out or deposition zones) considering:
 - geological materials
 - hydrological and permeability characteristics
 - slope and geomorphology (derived from high-resolution digital terrain models)
- Derived from authoritative BGS geological mapping, geotechnical data, and geomorphological interpretation
- Periodically updated to incorporate new geological information and improved mapping
- Designed for early-stage assessment, complementing but not replacing site-specific investigation
- Delivered as a bundle with the GeoSure landslides data for a complete assessment of landslide susceptibility

Licencing

Indicative pricing for internal business use:

£0.35 per km²

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

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Target markets

- Transport and infrastructure owners, particularly road and rail
- Local authorities and planners
- Engineering and geotechnical consultants
- Insurance, lenders and risk analysts
- Risk managers responsible for national or regional hazard assessment

Challenges faced by customers

- Difficulty identifying where debris flows could originate, especially in remote upland terrain
- Lack of consistent national data for infrastructure planning, route maintenance and asset risk assessment
- High costs from unexpected events and repeated closures
- Need for evidence-based hazard information to support cost benefit analysis studies, infrastructure design proposals, insurance and property valuation
- Challenges managing outside party slopes that threaten rail and road assets

Use cases

- Rail network hazard screening: assessing landslide hazards from outside party slopes
- Road corridor risk assessment: identifying high-susceptibility slopes along trunk roads to support emergency response preparedness and road maintenance budgeting
- Utility route planning: screening pipeline or overhead line corridors for slope failure exposure
- Local authority hazard mapping: supporting planning policy, emergency planning and climate resilience strategies
- Insurance risk modelling: informing underwriting and pricing for properties in upland or steep slope regions
- Environmental and academic research: understanding geomorphological processes and slope evolution

Contact

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Web page QR code



Overview

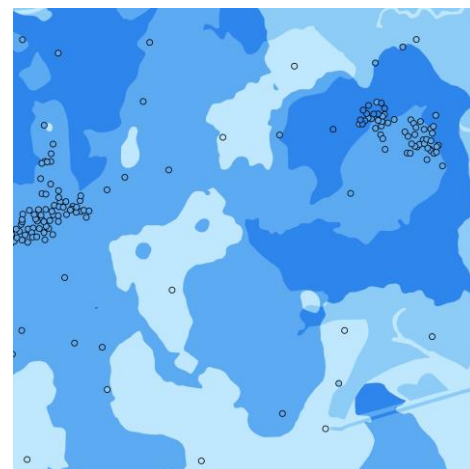
BGS's GeoSure® insurance and lenders product provides an index-level assessment of potential financial loss from natural ground movement on low-rise buildings across Great Britain. It combines six geological hazards — landslides, shrink-swell subsidence, soluble rocks, running sands, compressible ground and collapsible deposits — into a normalised hazard rating. A combined hazard score for all six hazards is provided along with hazard scores for individual hazards. Score areas are available attached to postcodes or as raster and vector map formats with hazard scores presented as geospatial extents, with national coverage. Postcode data is updated biannually with new releases of OS Code-Point® data.

Product benefits

- Offers a standardised, national-scale hazard index for insurance and lending decisions
- Supports hazard identification, underwriting and susceptibility estimation using statistically evaluated and expert elicited hazard models
- Provides consistent hazard ratings, enabling rapid integration into insurance workflows
- Provides combined and individual hazard scores supporting user preferences and flexibility of application
- Scores attached to regularly updated postcodes, allowing rapid, location-enabled analysis
- Available as raster and vector map formats with hazard scores presented as geospatial extents allowing for bespoke analysis

Key features

- National coverage across Great Britain
- 1:50 000 scale (± 50 m)
- Various GIS formats for ease of geospatial analysis:
 - vector point data representing postcode centroids: summary hazard ratings per postcode area with bespoke statistical summaries applied depending on postcode size
 - vector polygon map data with hazard ratings provided per geological unit
 - raster (25 m cell size) map data with hazard ratings provided per geological unit
- Hazard ratings for six ground instability hazards have been normalised to consider the relative severity of the impact from each hazard and balance them against one another
- Normalised ratings for each individual hazard are summed, giving a combined score that represents the likelihood of the impact from all six hazards
- Coverage of every postcode in Great Britain, updated biannually with OS Code-Point® data
- Raster and vector map formats present hazard scores as geospatial extents with national coverage, supporting bespoke analysis
- Gives a unified hazard rating specifically designed for use in insurance and lending sectors to identify the potential hazard for low-rise buildings (two-storey, residential buildings) and those with shallow foundations of less than 2 m



Licensing

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Further information

[See overleaf](#)



Target markets

- Insurance companies
- Lenders

Challenges faced by customers

- Difficulty specifically assessing impacts to buildings from ground movement consistently across regions
- Assessing multiple geological hazards in a single, comparable metric
- Lack of flexibility to assess specific areas of interest to single or multiple ground instability hazards
- Necessary to assess entire portfolios for hazard susceptibility with diverse spatial coverage
- Regulatory requirements to stress-test portfolios for financial resilience to hazards
- Need for accessible, postcode-level insights
- Requirement for regular updates to location information, for example postcodes

Use cases

- Underwriting: flagging high-risk postcodes or areas of interest for additional scrutiny or premium adjustment
- Portfolio risk modelling: aggregating hazard scores to understand exposure across regions
- Claims triage: identifying whether geological conditions may have contributed to subsidence
- Risk diversification: identifying hazard hotspots or low-susceptibility, untapped markets
- Mortgage originations: identifying susceptibility to a range of ground instability hazards
- Back book analysis: understanding hazard susceptibility at a portfolio scale
- Stress testing: testing portfolios to ensure financial resilience in line with regulatory requirements
- Re-insurance placement: understanding the level of re-insurance required to safeguard portfolios

Contact

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Overview

BGS's GeoSure® shrink-swell 3D for London and the Thames Valley dataset is a specialised ground stability dataset modelling the three-dimensional distribution and behaviour of shrink-swell clays beneath one of the UK's most subsidence-prone and infrastructure-dense regions. It builds on the standard GeoSure® shrink-swell dataset by incorporating depth-based modelling, engineering geology and detailed characterisation of the London Clay Formation, the Lambeth Group and other clay-rich geological units that are known for significant volume change. The dataset provides a spatially continuous 3D assessment of how clay behaviour varies with depth, moisture and geological structure.

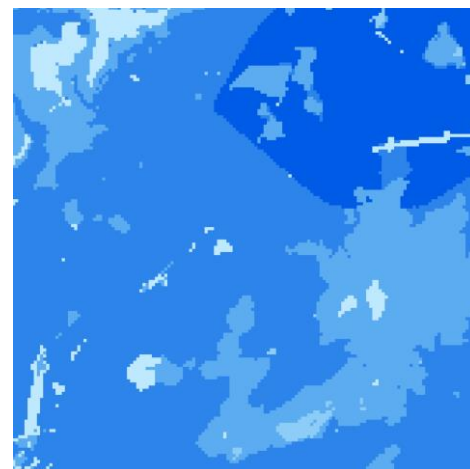
Product benefits

The dataset offers a more advanced and location-specific understanding of shrink-swell behaviour than standard national products, helping users to:

- anticipate volume change behaviour at depth, not just at the surface
- improve foundation design, especially for basements, deep excavations and infrastructure
- reduce uncertainty in ground movement risk, particularly in areas with clay deposits at depth
- support urban planning and asset management in a region where shrink-swell is a major cause of structural damage
- integrate 3D geological behaviour into risk modelling, engineering design and resilience planning

Key features

- Coverage of central London and surrounding transport corridors
- 1:50 000 scale (± 50 m)
- 3D shrink-swell modelling, capturing depth-dependent behaviour of clay formations at 1 m intervals to a depth of 5 m, beyond which shrink-swell susceptibility classifications are provided at 5 m intervals to a depth of 20 m
- High-resolution characterisation of the London Clay Formation, the Lambeth Group and other key geological units derived from the BGS London Lithoframe model
- Modelling is constrained by borehole records, geological maps and geophysical data compiled by regional geological experts from the premier provider of British geological data
- Five hazard classes, indicating susceptibility to volume change at different depths
- GIS-ready vector datasets



Licensing

Indicative pricing for internal business use

Price on application for commercial use (subject to number of users, licence fee and data preparation fee).

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Target markets

- Geotechnical, environmental and civil engineers
- Local authorities, planners and developers
- Transport and utilities infrastructure owners and operators
- Insurance, lenders and risk analysts

Challenges faced by customers

- Surface-only datasets are insufficient for deep foundations, tunnels and basements
- Highly variable clay behaviour across short distances makes early-stage design difficult
- Climate-driven moisture changes increase shrink–swell risk, especially during droughts
- High cost of unexpected ground movement, including structural damage, service disruption and insurance claims
- Limited visibility of subsurface clay properties, especially in densely built-up areas with restricted access for investigation
- Complex geological layering in the London Basin, where different clay units behave differently with depth

Use cases

- Basement and deep foundation design: understanding shrink–swell behaviour at multiple depths to select appropriate foundation types
- Tunnel alignment planning: identifying zones of high-volume change potential along underground routes
- Utility corridor management: assessing risks to pipelines, sewers and cables buried at varying depths
- Subsidence risk modelling: supporting insurers and local authorities in identifying high-risk neighbourhoods
- Climate resilience planning: evaluating how drought-driven moisture loss may affect clay shrinkage at depth

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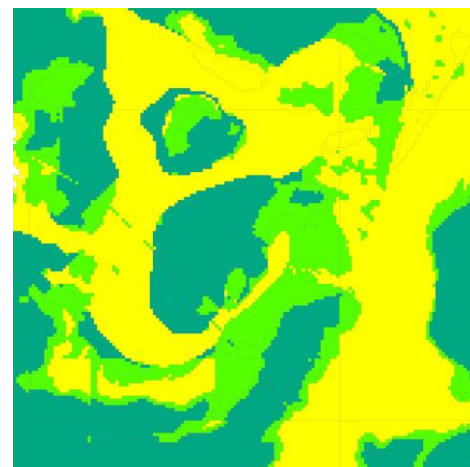
BGS's groundwater flooding provides an assessment of areas in Great Britain where geological conditions could enable groundwater flooding at the surface. The data also highlights areas where groundwater may come close to the ground surface, affecting basements and buried infrastructure. It identifies where geological, hydrogeological and topographical conditions make groundwater flooding more likely, including bedrock aquifers, permeable superficial deposits, topographical controls and areas with shallow water tables. The dataset supports planning, infrastructure design, flood-risk management and emergency preparedness by offering a consistent, evidence-based view of groundwater-related flood hazards.

Product benefits

- Highlights flood mechanisms not captured by surface water or river flood models, giving a more complete view of flood risk
- Supports planning and development decisions, especially in areas with permeable bedrock or superficial deposits
- Helps infrastructure owners anticipate groundwater emergence, which could damage basements, tunnels, utilities and transport corridors
- Provides evidence for flood risk assessments, resilience planning and regulatory compliance.
- Offers a nationally consistent, geologically informed assessment that improves early-stage risk screening

Key features

- National coverage across Great Britain
- 1:50 000 scale (± 50 m)
- Geologically informed susceptibility mapping, considering bedrock aquifer properties, superficial deposits, topography and hydrogeological observations where available
- Simple classification of groundwater flooding susceptibility, highlighting areas susceptible to groundwater flooding at the surface, areas where groundwater levels may impact property or assets below the ground surface and areas unlikely to experience groundwater flooding
- A supporting layer indicates confidence in the susceptibility classification, allowing users to critically assess the data for their needs
- GIS vector format for ease of geospatial analysis
- Supports multi-source flood risk assessment, complementing river, coastal and surface water datasets



Licensing

Indicative pricing for internal business use

£0.35 per km²

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Target markets

- Local authorities and planners
- Environmental agencies
- Civil, environmental and geotechnical engineers
- Transport and utilities infrastructure owners and operators
- Insurance, lenders and risk analysts
- Conveyancing reporters
- Emergency planners
- Developers and landowners

Challenges faced by customers

- Limited awareness of groundwater flooding, which is often overlooked compared with river or surface water flooding
- Unexpected groundwater emergence causing damage to basements, foundations and underground infrastructure
- Lack of consistent national data, making it difficult to assess risk across large portfolios or regions
- Complex geological controls on groundwater behaviour that are hard to interpret without specialist datasets

Use cases

- Planning applications: screening proposed developments for groundwater flooding constraints before design begins
- Basement and foundation design: identifying areas where groundwater pressure or emergence may require waterproofing or drainage
- Infrastructure resilience: assessing risk to tunnels, cuttings, culverts and buried utilities
- Flood risk assessments: incorporating groundwater flooding into multiple-source flood modelling
- Portfolio level risk analysis: helping insurers or asset managers understand exposure across large geographical areas
- Emergency response planning: identifying communities that are vulnerable during prolonged wet winters or rapid recharge events

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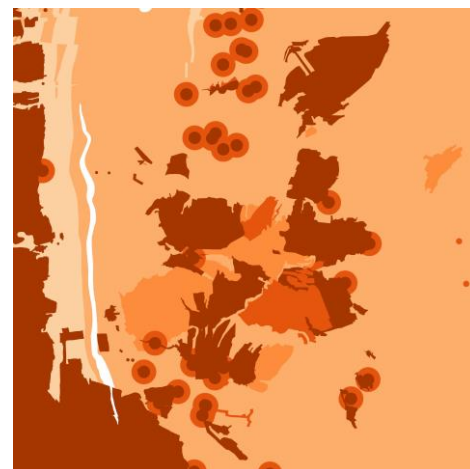
BGS's mining hazard (not including coal) dataset provides a national assessment of where past underground non-coal mining may have occurred and the potential for associated ground instability. It maps the location, extent and indicative hazard level of former underground workings across Great Britain, drawing on geological evidence, mine plans, scientific literature and expert knowledge, and represents the most comprehensive national overview of Britain's non-coal mining legacy.

Product benefits

- Consistent, national classification of non-coal mining hazards, supporting early-stage planning and risk screening
- Helps identify where underground voids may exist, even when no surface evidence remains
- Compiles evidence from various sources into a single resource, streamlining data discovery and evidence-gathering efforts
- Applies a bespoke methodology for seven different commodity types, considering different mining styles to provide a comprehensive and robust assessment
- Helps prioritise site investigations, focusing resources where mining is likely or known

Key features

- National coverage across Great Britain
- 1:50 000 scale (± 50 m)
- Five-class hazard rating system with detailed class descriptions
- Name of legacy working provided (where known) to support further research
- Bespoke methodology for seven commodity categories, each processed using tailored geological criteria
- Derived from multiple sources, including authoritative BGS geological mapping, mine abandonment plans, BGS databases of known working locations and mining literature reviews
- GIS vector format for ease of geospatial analysis
- Periodically updated to incorporate newly available mining records and improved geological mapping
- Designed for early-stage assessment, complementing but not replacing site-specific investigation
- Open access available for a generalised, low-resolution version of the data



Licencing

Indicative pricing for internal business use

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Target markets

- Local authorities and planning officers
- Transport and utilities infrastructure owners and managers
- Engineering and environmental consultants
- Insurers, lenders and risk assessors
- Conveyancing reporters
- Developers and landowners
- Mineral and land-use planners

Challenges faced by customers

- Lack of reliable historical mining records, especially for small-scale or undocumented workings
- Unexpected ground collapse or subsidence, which are costly to repair and mitigate
- Fragmented data sources spread over multiple repositories, requiring expert interpretation
- Regulatory and due-diligence requirements for land development and asset management
- Uncertainty about the extents of old workings, especially where only partial plans exist

Use cases

- Infrastructure risk assessment: identifying roads, pipelines or railways at risk from collapse
- Planning applications: screening development sites for potential mining-related hazards
- Site investigation scoping: determining where intrusive investigation or geophysical surveys are required
- Asset management: prioritising maintenance or monitoring in areas with known or likely underground voids
- Emergency response planning: understanding areas susceptible to sudden ground failure
- Insurers: supporting insurance underwriting and claims analysis for ground subsidence
- Lenders: informing loan approval for mortgage applications
- Property transactions: reporting potential hazards to properties during conveyancing searches
- Historical mining research: mapping the distribution of non-coal mining across Great Britain

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Overview

BGS's property subsidence assessment dataset evaluates the likelihood of shrink-swell subsidence affecting individual properties across Great Britain. It combines geological data, tree locations and building characteristics to estimate how susceptible a property is to ground movement caused by the expansion and contraction of clay-rich soils. The dataset provides building-level insight, making it suitable for insurance, risk modelling, conveyancing searches and portfolio management applications.

Product benefits

- Granular insights into shrink-swell hazards at both building and postcode levels
- Consideration of geological conditions, specific building attributes and local vegetation to provide a tailored assessment of susceptibility
- Regular updates mapping BGS susceptibility classes to the latest available building footprints
- Specifically developed for use in the conveyancing sector to identify high-risk areas and support customisation of risk profiles

Key features

- National coverage across Great Britain
- Property-level subsidence risk assessment, offering accessible, fine-scale insights
- Postcode-level summaries available
- A combined susceptibility score considering:
 - underlying geology type
 - property age
 - drainage systems
 - building type
 - number of storeys
 - tree proximity
- Provides a comprehensive understanding of subsidence risks
- Individual scores per susceptibility factor are also provided, supporting flexible application of the scoring
- Consistent methodology, enabling comparison across regions and portfolios
- Regular updates to reflect the latest available building footprint, building properties and tree location data
- GIS vector format for ease of geospatial analysis



Licensing

Due to third-party contractual terms, BGS is not able to supply this data directly for internal business use.

Property-specific reports for property subsidence assessment data are available from some of our re-seller partners.

Find a [full list of BGS re-sellers](#) on our website.

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Further information

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Target markets

- Conveyancing reporters

Challenges faced by customers

- Limited visibility of property-level risk, as many datasets only provide regional or geological summaries
- Difficulty integrating geological data into property assessment workflows or interpreting geological maps for subsidence hazards
- Inconsistent or incomplete local information, making national-scale risk assessment difficult

Use cases

- Property searches triage: assessing whether reported structural damage is consistent with shrink-swell behaviour
- Proactive risk mitigation: understanding the factors contributing to subsidence hazards allows property owners to implement risk mitigation strategies
- Property valuation: informing surveyors about long-term ground movement risk
- Property transactions: reporting potential hazards to properties during conveyancing searches

Contact

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Overview

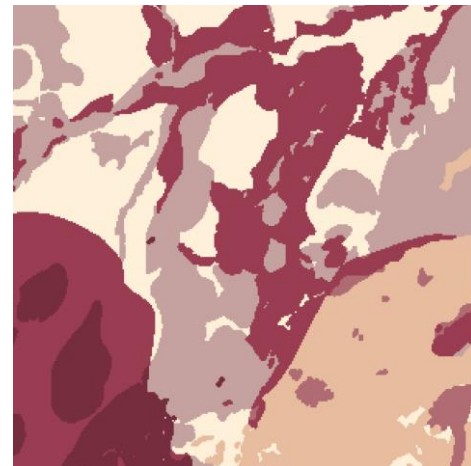
BGS's radon potential dataset provides an assessment of the likelihood that radon gas will be present at elevated levels in homes and workplaces across Great Britain and Northern Ireland. Radon is a naturally occurring, radioactive gas that can accumulate indoors and is a recognised health risk. The dataset combines interpretation of geological mapping, indoor radon measurements and statistical modelling to map radon potential at a fine spatial scale. Developed in collaboration with the UK Health Security Agency (UKHSA), it is the authoritative national dataset used by Government, public health bodies, planners and property professionals.

Product benefits

- Supplies a trusted, authoritative assessment of radon potential based on extensive measurements and geological understanding
- Fine-scale mapping that helps identify where radon protection measures are required in new buildings
- Supports adherence to statutory obligations set out in public health legislation
- Provides evidence for public health planning, risk communication and targeted testing campaigns
- Informs property transactions, mortgage assessments and home-buyer information

Key features

- National coverage across Great Britain and Northern Ireland
- 1:50 000 scale (± 50 m)
- Integration of geology and indoor radon measurements, providing a robust evidence base
- Radon potential classification, indicating the probability that a property will exceed the UK Action Level
- Nation-specific attribution, with regional variations in radon legislation and action levels for England, Northern Ireland, Scotland and Wales accounted for and regional specific classifications and advice given for each nation
- BGS GeoReports are available for site-specific queries
- GIS vector format for ease of geospatial analysis
- Periodic updates, incorporating new measurements and improved modelling
- Official dataset developed by leading radon authorities (BGS, the Geological Survey of Northern Ireland and UKHSA) and used by the UK Government and public health bodies to define radon-affected areas
- Open access is available for a generalised, low-resolution version of the data



Licencing

Indicative pricing for internal business use

£0.35 per km²

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> [Northern Ireland](#)

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Target markets

- Local authorities and planners
- Public health agencies
- Property professionals, including surveyors, conveyancers and estate agents
- Homebuyers and homeowners
- Developers and architects
- Infrastructure owners and operators
- Environmental and risk consultants

Challenges faced by customers

- Limited awareness of radon risk, especially in areas where geology strongly influences indoor concentrations
- Uncertainty during property transactions, as buyers and sellers need reliable radon information
- Regulatory requirements for radon protection in new buildings, which need accurate mapping
- Health risks associated with long-term radon exposure, including increased risk of lung cancer
- Fragmented or outdated local information, making national-scale assessment difficult without a unified dataset
- Difficulty identifying priority testing areas, particularly for local authorities and public health teams

Use cases

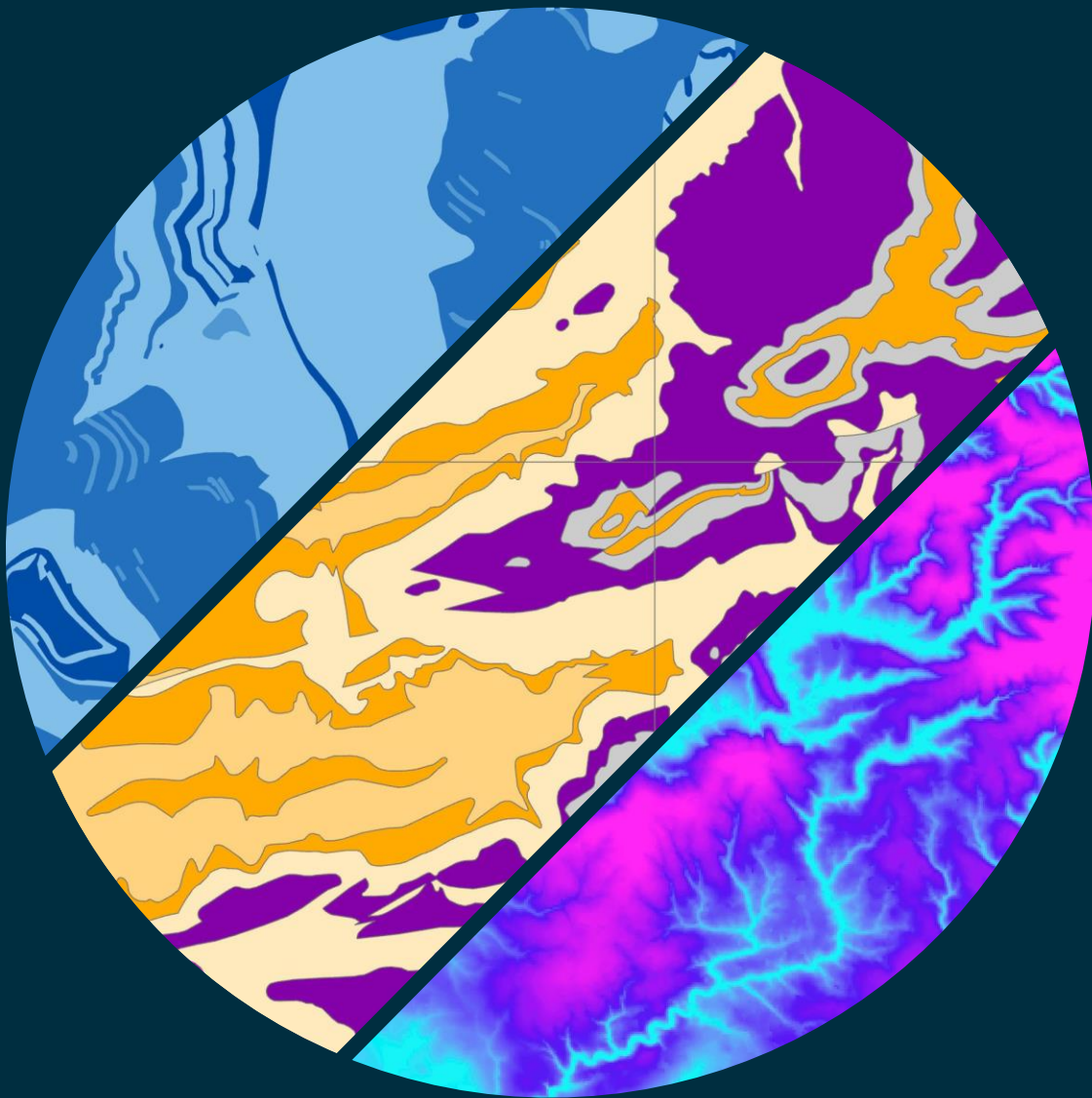
- Planning and building control: determining whether new buildings require basic or full radon protection measures
- Property surveys: providing radon risk information during home purchase or valuation
- Public health campaigns: identifying high-risk communities for targeted radon testing
- Workplace risk assessments: ensuring compliance with radiation safety regulations in basements, tunnels or ground-contact structures
- Environmental risk reporting: integrating radon potential into wider environmental or geohazard assessments

Contact

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HYDROGEOLOGY

BGS's hydrogeology products provide information on aquifer types and vulnerability, groundwater levels, the permeability of geological deposits and their suitability for hosting sustainable drainage systems.

These datasets include:

[Aquifer designation](#) Classification of bedrock and superficial aquifers for England and Wales

[Depth to groundwater](#) Modelled assessment of depth to the water table

[Groundwater vulnerability](#) Classification of susceptibility to contamination of groundwater in England and Wales

[Hydrogeological maps of Scotland](#) Overview of groundwater characteristics across Scotland

[Infiltration SuDS map](#) Assessment of the suitability of the ground for infiltration-based sustainable drainage systems

[Permeability](#) Assessment of the infiltration potential and permeability characteristics of superficial deposits and bedrock geology

Overview

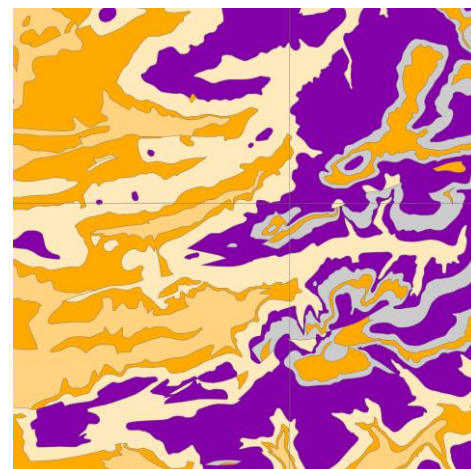
BGS's aquifer designation dataset defines bedrock and superficial aquifers for England and Wales, identifying where geological units act as principal or secondary aquifers or unproductive strata, based on their ability to store and transmit groundwater. These designations were developed in collaboration with the Environment Agency and underpin national groundwater management policy, supporting decisions about abstraction, protection and land-use planning. The dataset provides a consistent, authoritative framework for understanding groundwater resources at regional and local scales.

Product benefits

- Provides a standardised national classification of aquifers used by regulators, planners and consultants
- Helps determine the importance of groundwater resources in a given area
- Supports risk assessments for pollution, abstraction and development
- Informs planning decisions, especially where groundwater protection zones or sensitive aquifers are present
- Helps identify where groundwater may be a viable water supply source
- Reduces uncertainty by offering a clear, policy-aligned interpretation of geological units

Key features

- National coverage for England and Wales
- 1:50 000 scale (± 50 m)
- Classification of aquifer type as:
 - principal: deposits that provide a high level of water storage
 - secondary: deposits that can support water supplies at a local rather than strategic scale
- Assessment of both bedrock and superficial deposits
- GIS vector format for ease of geospatial analysis
- Consistent methodology aligned with regulatory frameworks
- Free to view online



Licensing

Available to view via the [Defra Magic Portal](#) (England) and the [BGS GeoIndex](#) (Wales).

Indicative pricing for internal business use

£0.35 per km²

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

Non-commercial users should contact the Environment Agency (for England) or Natural Resources Wales (for Wales) for access.

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[See overleaf](#)

Target markets

- Environmental consultants
- Local authorities and planners
- Water companies
- Environmental regulators
- Researchers studying groundwater systems and resource management

Challenges faced by customers

- Difficulty differentiating aquifer types without specialist hydrogeological knowledge
- Regulatory requirements to assess groundwater impacts in planning and environmental permitting
- Uncertainty about abstraction potential, especially in areas with complex geology
- Challenges identifying pollution sensitive aquifers, particularly where superficial deposits obscure bedrock
- Need for early-stage screening before detailed hydrogeological investigations are commissioned

Use cases

- Pollution risk assessments: evaluating the vulnerability of groundwater to contamination from industrial or agricultural activities
- Water resource planning: identifying areas with potential for new groundwater abstraction
- Infrastructure design: screening routes for aquifer sensitivity to avoid contamination or dewatering impacts
- Environmental permitting: supporting decisions for waste sites, fuel storage or discharge to land
- Catchment management: understanding how aquifer types influence recharge, flow and water availability

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 - > [Wales](#)
- > Metadata:
 - > [England](#)
 - > [Wales](#)
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Depth to groundwater

Overview

BGS's depth to groundwater dataset assesses how deep the (phreatic) water table is likely to be beneath the ground surface across Great Britain. It draws on topography, knowledge of surface water/groundwater interactions and permeability mapping to estimate the typical depth to groundwater. The data also flags areas where geological conditions may result in significant variations in groundwater levels from those presented by the model. Due to the poor spatial distribution of groundwater observations, the model does not utilise measured groundwater levels in wells or boreholes directly, but they have been used to validate model performance.

Product benefits

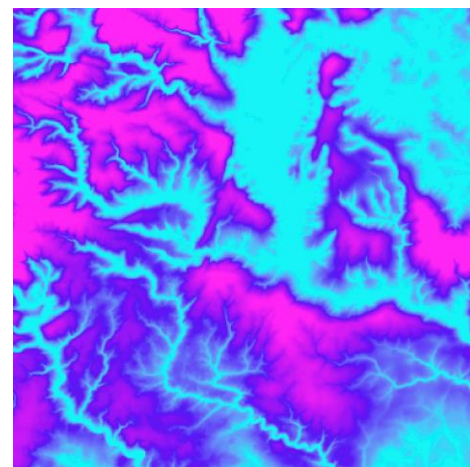
- Offers a nationally consistent indication of groundwater depth
- Helps identify where shallow groundwater may pose risks to basements, foundations, excavations and underground infrastructure
- Provides evidence for flood risk assessments, especially in areas prone to groundwater emergence
- Offers a modelled view of groundwater levels where local monitoring data is limited or unavailable
- Helps screen sites before detailed hydrogeological investigations are commissioned

Key features

- National coverage across Great Britain
- 1:50 000 scale (± 50 m)
- Modelled depth to groundwater values presented as a raster grid
- Supplementary vector overlay identifying areas where phreatic groundwater levels may vary significantly from the raster grid
- GIS vector and raster formats for ease of geospatial analysis

Target markets

- Civil, environmental and geotechnical engineers
- Local authorities and planners
- Developers
- Water and sewerage companies
- Transport and utilities infrastructure owners



Licensing

Indicative pricing for internal business use

£0.18 per km²

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

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Challenges faced by customers

- Difficulty accessing consistent geological information at national and regional scale from disparate sources
- Need for digital geospatial data rather than legacy paper maps
- Uncertainty about subsurface conditions making early-stage assessment difficult without authoritative mapping
- Time-consuming compilation of robust geological evidence to meet legislative and regulatory requirements
- Challenging ground conditions cause delays and cost overruns if not identified early
- Complexity of national asset networks with a need to understand ground conditions for thousands of distributed assets

Use cases

- Construction planning: assessing dewatering needs for excavations, basements or utility trenches
- Flood risk assessment: evaluating the potential for groundwater emergence during wet periods
- Infrastructure resilience: screening rail cuttings and tunnels for groundwater-related risks
- Land-use planning: identifying constraints for developments in low-lying or permeable areas

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Overview

The groundwater vulnerability dataset has been created by the Environment Agency and Natural Resource Wales using BGS data. It classifies how susceptible groundwater in England and Wales is to contamination from activities at the land surface based on hydrological, geological, hydrogeological and soil properties. Separate assessments of vulnerability and productivity are available for bedrock and superficial deposits. An additional, simplified view of the groundwater vulnerability layer is available for non-specialists who need to know the overall risk to groundwater without extensive hydrogeological knowledge.

Product benefits

- A consistent national interpretation of England and Wales' hydrogeology, essential for early-stage planning and assessment
- Supports regulatory requirements for environmental permitting, planning and pollution risk assessments
- A foundation for flood risk and drainage assessments, where groundwater behaviour influences design
- Informs land-use decisions, particularly for developments involving chemicals, waste or potential contaminants
- Assists water resource and environmental managers in protecting drinking water supplies and groundwater-dependent ecosystems

Key features

- National coverage for England and Wales
- 1:50 000 scale (± 50 m)
- Three-tier classification of groundwater vulnerability, from low to high, for both bedrock and superficial deposits
- Classification of aquifer type as:
 - principal: deposits that provide a high level of water storage
 - secondary: deposits that can support water supplies at a local rather than strategic scale
- Additional details on:
 - infiltration potential through soils
 - pollutant dilution potential
 - superficial deposit thickness and coverage
 - groundwater flow mechanisms for bedrock and superficial deposits
- Flags highlighting soluble rock risk where solution features enable rapid movement of pollutants and areas where the Environment Agency or Natural Resources Wales holds additional information
- A summary, five-class groundwater vulnerability map, incorporating bedrock and superficial deposits, giving a complete assessment of groundwater vulnerability
- GIS vector format for ease of geospatial analysis
- Alignment with regulatory frameworks, supporting planning and environmental compliance



Licensing

Indicative pricing for internal business use

£0.45 per km²

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

Free for non-commercial research and academic use; available from Environment Agency (England) and Natural Resources Wales (Wales).

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Target markets

- Environmental consultants
- Local authorities and planners
- Water resource managers and rural water-supply providers
- Environmental regulators
- Researchers studying groundwater systems, recharge and environmental change

Challenges faced by customers

- Difficulty assessing groundwater potential without specialist hydrogeological knowledge or on-site testing
- Regulatory requirements for groundwater considerations in planning and environmental permitting
- Uncertainty about pollution vulnerability, particularly where superficial deposits obscure bedrock aquifers
- Challenges designing sustainable drainage systems, foundations or excavations without understanding groundwater behaviour
- Need for early-stage screening before detailed site investigations are commissioned

Use cases

- Groundwater supply planning: identifying areas where bedrock or superficial aquifers may support private or community water supplies
- Pollution risk assessment: evaluating the vulnerability of aquifers to contamination from agriculture, industry, infrastructure or construction
- Catchment management: supporting river-basin planning and groundwater-dependent ecosystem assessments
- Environmental permitting: providing evidence for activities that may affect groundwater quality or recharge

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Overview

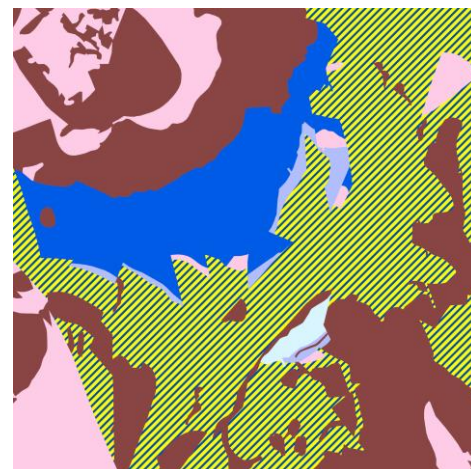
BGS's hydrogeological maps of Scotland provide an overview of groundwater characteristics, aquifer behaviour, recharge potential and groundwater flow across Scotland. The groundwater vulnerability layer assesses the ability for general contaminants to reach the water table. The aquifer productivity layer illustrates how different geological units function as aquifers, how water moves through them and where groundwater resources are likely to be significant or limited, for both bedrock and superficial deposits.

Product benefits

- A consistent national interpretation of Scotland's hydrogeology, essential for early-stage planning and assessment
- Insight into aquifer productivity, permeability and groundwater availability
- Evidence for groundwater protection, pollution risk assessment and regulatory compliance
- Support for water supply planning, especially in rural or remote areas where groundwater is a key resource
- A foundation for flood risk and drainage assessments, where groundwater behaviour influences design
- A clear understanding of how geology controls groundwater flow, recharge and storage

Key features

- National coverage across Scotland
- 1:100 000 scale (± 100 m)
- Classification of aquifer productivity, including predominant groundwater flow mechanism and associated likely borehole yields (litres per second)
- Assessment of aquifer productivity for both bedrock and superficial deposit aquifers
- Five-class assessment of aquifer vulnerability, from very low to very high
- Assessment of individual factors influencing aquifer vulnerability, including:
 - bedrock groundwater flow mechanism
 - maximum permeability of superficial and bedrock deposits
 - thickness of overlying superficial deposits
 - presence of significant clay deposits
 - depth to groundwater in superficial and bedrock aquifers
- GIS vector format for ease of geospatial analysis
- Consistent methodology aligned with Scottish regulatory frameworks



Licensing

Indicative pricing for internal business use

£0.45 per km²

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

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Target markets

- Environmental consultants
- Local authorities and planners
- Water resource managers and rural water-supply providers
- Environmental regulators
- Researchers studying groundwater systems, recharge and environmental change

Challenges faced by customers

- Difficulty assessing groundwater potential without specialist hydrogeological knowledge or on-site testing
- Regulatory requirements for groundwater considerations in planning and environmental permitting
- Uncertainty about pollution vulnerability, particularly where superficial deposits obscure bedrock aquifers
- Challenges designing sustainable drainage systems, foundations or excavations without understanding groundwater behaviour
- Need for early-stage screening before detailed site investigations are commissioned

Use cases

- Groundwater supply planning: identifying areas where bedrock or superficial aquifers may support private or community water supplies
- Pollution risk assessment: evaluating the vulnerability of aquifers to contamination from agriculture, industry, infrastructure or construction
- Catchment management: supporting river-basin planning and groundwater-dependent ecosystem assessments
- Environmental permitting: providing evidence for activities that may affect groundwater quality or recharge

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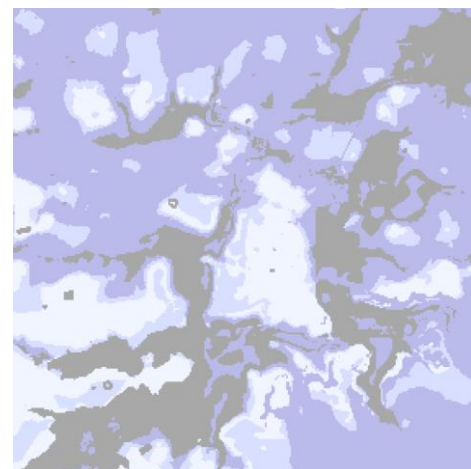


Overview

BGS's infiltration SuDS map assesses the suitability of the ground for infiltration-based sustainable drainage systems (SuDS) across Great Britain. Infiltration SuDS are drainage systems such as soakaways, infiltration basins, infiltration trenches and permeable pavements that allow surface water to infiltrate the ground. The dataset evaluates geological, hydrogeological and regulatory constraints on the infiltration of water into the ground, considering ground instability hazards, protection of groundwater resources and the drainage potential of geological deposits. Detailed and summary versions of the dataset are available, providing a wealth of subsurface property information that can be used to make a preliminary assessment of the suitability of the subsurface for infiltration SuDS.

Key features

- National coverage across Great Britain
- 1:50 000 scale (± 50 m)
- GeoReports are available for site-specific queries
- GIS vector format for ease of geospatial analysis
- Detailed assessment of infiltration constraints, including:
 - drainage potential, considering:
 - permeability of bedrock and superficial deposits
 - thickness of overlying superficial deposits
 - depth to the water table
 - interactions with river floodplains
 - groundwater protection, considering:
 - potential pollutant mobility in aquifer deposits
 - sources of pollutants from artificial ground
 - presence of groundwater protection zones
 - potential for infiltration to induce hazards, considering:
 - natural ground instability hazards
 - ground instability hazards relating to legacy mine workings
 - groundwater flooding
- Choice of summary overview or detailed breakdown of individual factors allows users to tailor the assessment to their specific use case and consider the most relevant constraints
- Four-class suitability rating system, from favourable to highly constrained
- Consistent methodology, enabling comparison across sites and regions
- Designed for early-stage screening, complementing site-specific infiltration testing



Licencing

Indicative pricing for internal business use

Detailed: £1.71

Summary: £0.58

Prices per km²

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Product benefits

- Provides a nationally consistent assessment of infiltration potential, reducing uncertainty in the early stages of a project
- Supports compliance with planning policy, which increasingly requires infiltration SuDS in new developments
- Helps identify where infiltration SuDS are feasible, constrained or unsuitable, avoiding costly design changes later
- Provides an evidence-driven assessment of infiltration performance ahead of on-site testing
- Assists in flood risk reduction, surface water management and climate resilience planning

Target markets

- | | |
|--|---|
| • Local authorities and planners | • Developers |
| • Civil engineers and drainage designers | • Water and sewerage companies |
| • Environmental and geotechnical engineering consultants | • Transport and utilities infrastructure owners |

Challenges faced by customers

- Difficulty assessing the most appropriate form of infiltration SuDS, especially in areas with complex geology or shallow groundwater
- Regulatory pressure to include infiltration SuDS in planning applications before site testing, without clear evidence of feasibility
- Unexpected design failures when infiltration capacity is overestimated
- High costs associated with redesigning drainage systems when infiltration proves unsuitable
- Challenges interpreting geological and hydrological information for drainage planning

Use cases

- Early-stage drainage strategy design: screening sites to determine whether infiltration SuDS are feasible before detailed investigation
- Planning applications: providing evidence to meet local planning requirements
- Flood risk assessments: identifying opportunities to reduce run-off through infiltration
- Urban redevelopment: evaluating whether brownfield sites can incorporate infiltration drainage
- Catchment-scale planning: supporting local authorities in identifying areas suitable for nature-based drainage solutions

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Overview

BGS's permeability dataset qualitatively assesses the permeability characteristics of superficial deposits and bedrock geology across Great Britain. Permeability is the capacity of a rock to transmit a fluid. The dataset classifies how easily water can move vertically through the ground based on known hydrogeological characteristics of the various lithologies, considering their age, dissolution potential, degree of cementation and induration, and fracturing. The data provides a minimum and maximum permeability class along with a predominant flow mechanism.

Product benefits

- Offers a nationally consistent permeability classification for the unsaturated zone
- Helps determine the feasibility of infiltration-based drainage systems, including infiltration SuDS
- Supports groundwater and hydrological assessments where permeability influences recharge, flow and storage
- Provides essential evidence for flood risk assessments, especially where infiltration or groundwater rise is a concern
- Helps prioritise site investigations, focusing resources where infiltration may constrain site drainage or require implementation of groundwater protection measures

Key features

- National coverage across Great Britain
- 1:50 000 scale (± 50 m)
- Five-class permeability classification, from very low to very high
- Maximum and minimum permeability classification for both superficial deposits and bedrock
- Classification of the type of flow expected within a lithology
- GIS vector format for ease of geospatial analysis
- Designed for early-stage screening, complementing site-specific infiltration testing

Target markets

- Civil, environmental and geotechnical engineers
- Local authorities and planners
- Developers
- Water and sewerage companies
- Transport and utilities infrastructure owners



Licensing

Indicative pricing for internal business use

£0.12 per km²

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Challenges faced by customers

- Difficulty assessing infiltration potential ahead of site investigation without reliable geological data
- Unexpected groundwater behaviour during construction due to misjudged permeability
- Regulatory requirements for infiltration SuDS and drainage strategies that require permeability evidence
- Limited availability of measurements for water movement through the undersaturated zone above the water table
- High costs associated with redesigning drainage or foundation systems when permeability is misunderstood

Use cases

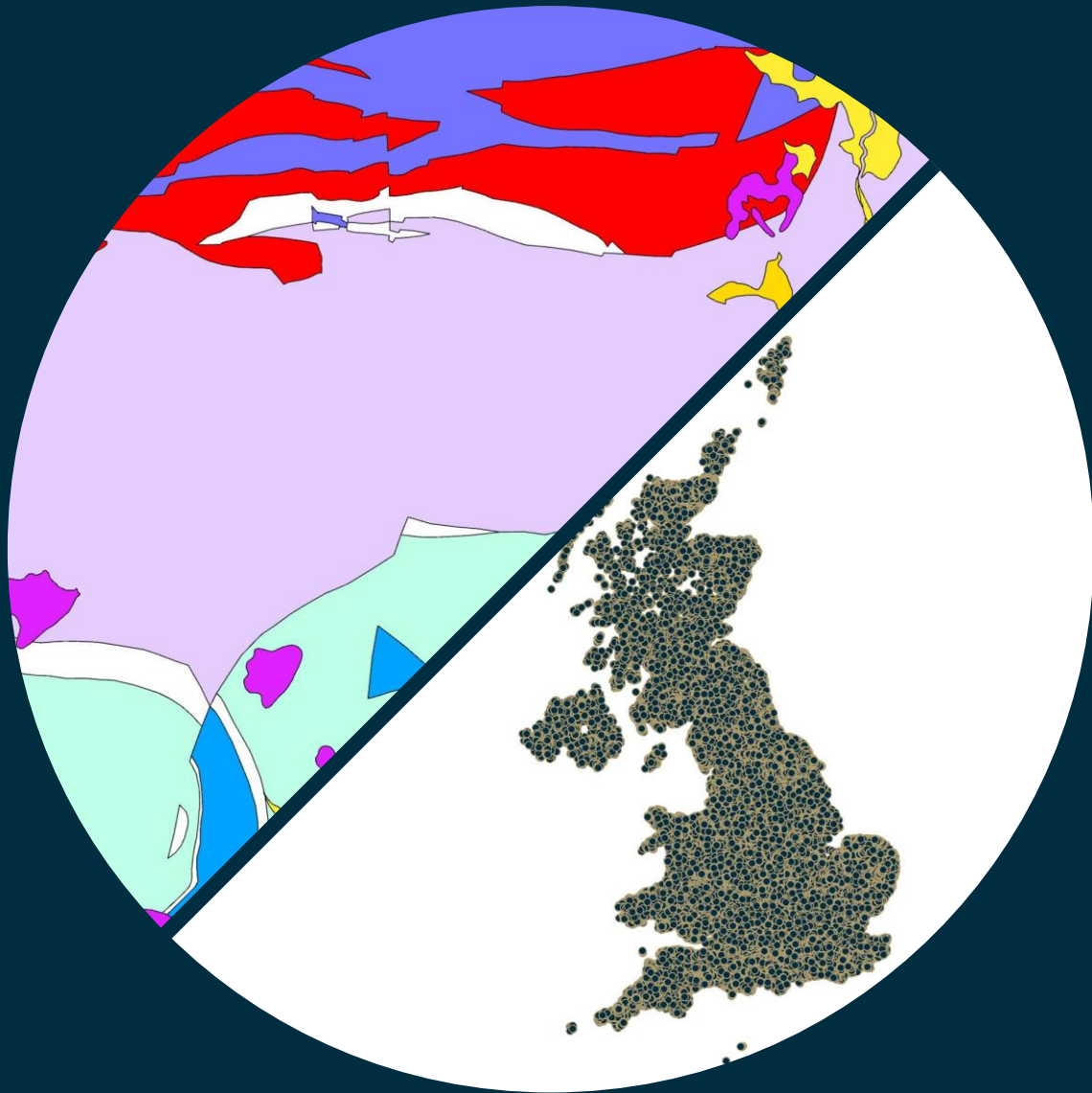
- Infiltration SuDS feasibility assessments: determining whether soakaways, infiltration basins or permeable pavements are suitable
- Flood risk assessments: understanding how infiltration capacity affects run-off and groundwater rise
- Foundation and construction planning: identifying areas where highly permeable or impermeable ground affects excavation or stability
- Groundwater and pollutant modelling: providing permeability context for recharge and flow simulations
- Infrastructure route planning: screening corridors for permeability-related risks such as rapid infiltration, perched water tables or pollution risk to vulnerable groundwater bodies
- Environmental impact assessments: evaluating how developments may alter infiltration, groundwater recharge and groundwater pollution

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MINERALS

BGS's minerals products catalogue active, inactive and historical mineral working locations and map the extent of potential mineral resources for various commodities across Great Britain.

These datasets include:

[BritPits](#) Database of active, inactive and historical mines, quarries and mineral extraction sites

[Mineral resources](#) Assessment of the location and extent of potential mineral resources

Overview

BritPits is BGS's comprehensive database of active, inactive and historical mines, quarries and mineral extraction sites across the UK. It records information on the location, operational status, ownership, extracted commodities and geological context of each site. The dataset is continually updated and is one of the most authoritative sources of information on mineral extraction activity, supporting planning, resource management, environmental assessment and industry analysis.

Product benefits

- A single, authoritative source of information on mineral extraction sites, past and present
- Detailed insight into the minerals that are or were extracted, helping assess resource potential
- Support for planning and permitting, where knowledge of nearby quarries or former workings is essential
- Evidence of legacy mining for geological, environmental and land-use assessments
- A way to identify commercial opportunities, such as suppliers of specific aggregates or industrial minerals

Key features

- National coverage for Great Britain, Northern Ireland, the Isle of Man and the Channel Islands
- X-Y point data representing the centre of surface workings (± 10 m) or the entrance of underground workings (± 50 m)
- Information on operational status, including active, inactive, dormant and closed sites
- Commodity data detailing minerals that are or were extracted
- Geographical coordinates in local projection systems for precise mapping and GIS integration
- Site name, ownership and operator information, where available
- Geological context, linking sites to bedrock and superficial deposits
- Regular updates to ensure current and historical accuracy
- GIS vector format for ease of geospatial analysis, along with tabular formats (CSV)
- Multi-tier dataset to suit all needs:
 - full dataset: all records held, including historical sites
 - active, inactive and dormant data: information on sites considered operational only
 - index data: name, status and location of all recorded workings (open access)



Licencing

Indicative pricing for internal business use

Full dataset: £56.78 per region (15 regions in total)

Active, inactive and dormant data: £170.34 for complete GB coverage only

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

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Target markets

- Mineral extraction companies and resource planners
- Local authorities and planning officers
- Environmental and engineering consultants
- Construction and infrastructure companies
- Landowners and developers

Challenges faced by customers

- Difficulty accessing consistent geological information at national and regional scale from disparate sources
- Need for digital geospatial data rather than legacy paper maps
- Uncertainty about subsurface conditions making early-stage assessment difficult without authoritative mapping
- Time consuming compilation of robust geological evidence to meet legislative and regulatory requirements
- Challenging ground conditions cause delays and cost overruns if not identified early
- Complexity of national asset networks with a need to understand ground conditions for thousands of distributed assets

Use cases

- Planning applications: checking for nearby quarries or historical workings that may affect development suitability
- Local development planning: identifying legacy sites that could be repurposed and active sites available to supply developments with raw materials
- Resource evaluation: assessing the potential for re-opening or expanding mineral extraction sites
- Supply chain analysis: finding producers of specific minerals such as limestone, sand and gravel, slate or industrial minerals
- Environmental impact assessments: understanding the legacy of extraction on landforms, hydrology and contamination

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Overview

BGS's mineral resources dataset assesses the location and extent of potential mineral resources for various commodities across Great Britain. It identifies areas where geological conditions indicate the presence of economically important minerals. Focus is given to construction and industrial minerals due to the importance of indigenous supply to the UK economy. It supports long-term resource planning, safeguarding and sustainable development by offering an authoritative, geology-based view of where mineral resources are likely to occur.

Product benefits

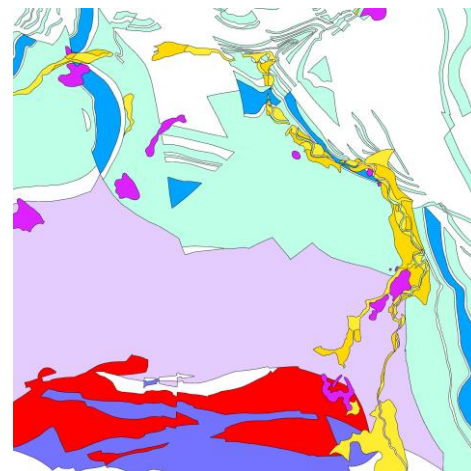
- Offers a consistent, authoritative national overview of mineral resource potential
- Supports mineral safeguarding, helping planning authorities protect important resources from sterilisation by development
- Helps identify areas with future extraction potential, supporting long-term supply security
- Provides evidence for planning applications, environmental assessments and land-use decisions
- Reduces uncertainty where local mineral information is incomplete or outdated
- Helps industry and Government understand strategic mineral distribution

Key features

- National coverage across Great Britain
- 1:50 000 scale (± 50 m)
- Geology-based delineation of mineral resource areas, providing details of deposit type and associated economic mineral resource
- Coverage of multiple commodity types, including aggregates, industrial minerals, building stone and construction resources
- GIS vector format for ease of geospatial analysis
- Complements other BGS datasets including BritPits, geological maps and mineral occurrence records

Target markets

- Mineral planning authorities and local government
- Mineral extraction companies and resource planners
- Environmental and engineering consultants
- Developers
- National and regional policymakers



Licensing

Indicative pricing for internal business use

£0.14 per km²

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Challenges faced by customers

- Difficulty identifying mineral resources without specialist geological knowledge
- Fragmented or outdated local datasets, especially for older or unworked deposits
- Regulatory requirements to consider mineral safeguarding in planning decisions
- Uncertainty about future resource potential, particularly for construction aggregates and industrial minerals
- Challenges assessing sterilisation risk, where development may prevent future extraction
- Need for early-stage screening before detailed geological investigations are commissioned

Use cases

- Mineral safeguarding assessments: determining whether proposed developments lie within safeguarded resource areas
- Planning applications: providing evidence on mineral potential to support or challenge development proposals
- Resource evaluation: identifying areas with potential for future quarrying or extraction
- Strategic planning: supporting local and national policies on mineral supply and land-use allocation
- Environmental impact assessments: understanding how developments may affect mineral resources or extraction viability
- Industry analysis: mapping the distribution of aggregates, building stone, industrial minerals or energy minerals

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