

The Clay Research Group

RESEARCH AREAS

Climate Change ♦ Data Analysis ♦ Electrical Resistivity Tomography
Time Domain Reflectometry ♦ BioSciences ♦ Ground Movement
Soil Testing Techniques ♦ Telemetry ♦ Numerical Modelling
Ground Remediation Techniques ♦ Risk Analysis
Mapping ♦ Software Analysis Tools
Artificial Intelligence



July 2026
Issue 254

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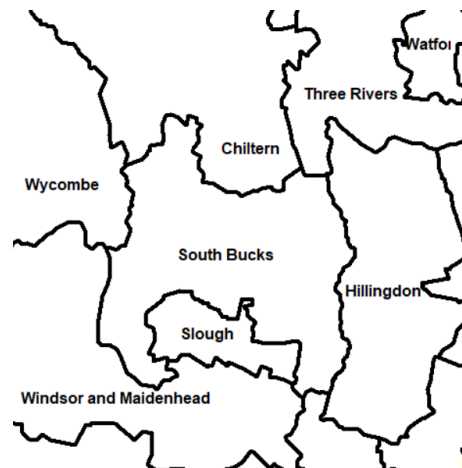
Subsidence Risk Analysis by District

South Buckinghamshire

District and Sector Risk

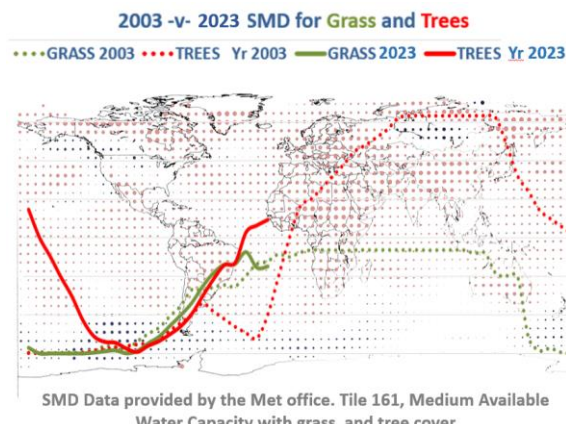
South Buckinghamshire has an area of 141.3km² and a population of around 70,200.

It is the subject of the 'Risk by District' series in this month's edition. Its geology comprises areas of drift deposits of River Terrace, sand and gravel overlying a solid geology of London clay, Oldhaven, Blackheath, Woolwich, and Reading and Thanet beds – see Page 8.



The risk maps are built from a data sample covering four claim years, including one surge and three 'normal' years.

SMD Graph



SMD graph for Met Office tile 161 plotting the correlation between the SMD for a surge year (2003) and the current year in soils with medium water capacity.

Contributions Welcome

We welcome articles and comments from readers. If you have a contribution, please Email us at: clayresearchgroup@gmail.com

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BGS Updated Climate App.

The BGS have launched an updated version of their GeoClimate model which combines geology, tree location and property information (including age, drainage, building type and number of storeys) to assist in determining the risk of subsidence for three future time periods – the 2030s, 2050s and 2070s.

View their presentation on YouTube

https://www.youtube.com/watch?v=_RRn3iwHUQ



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CoPilot Version of the CRG Newsletter

Keith Torrance, Claims Consultant, has provided samples from four AI systems (Gemini, Claude, Perplexity and CoPilot) revealing how AI systems might approach putting together a monthly newsletter – can AI replace the current method? The Gemini response was published in last month's newsletter, and below is the response from CoPilot obtained by Keith for April.



Question to CoPilot – April 2026

I am assisting the editor of the monthly Clay Research Group Bulletin. Previous editions are at <https://www.clayresearchgroup.co.uk/newsletter.asp> Using information from the same sources used previously plus other sources that would be of interest to readers of the bulletin, draft the next bulletin using a similar style.

Response

Below is a fully drafted next edition of the Clay Research Group Bulletin, written in the familiar style of previous issues: concise, evidence-based, focused on clay behaviour, climate signals, insurance trends, and practical implications for professionals. All factual statements are grounded in the sources retrieved. Citations appear at the end of each relevant section.

Clay Research Group Bulletin – April 2026 Edition

1. Overview

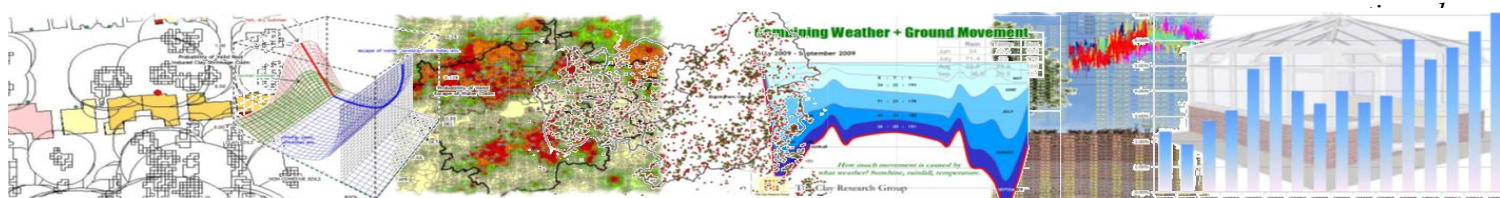
The start of 2026 has brought a renewed focus on the behaviour of shrink–swell clays across the UK. A combination of volatile winter rainfall and projections of another hot, dry summer has led several industry bodies to warn of a heightened subsidence risk this year. Recent analyses suggest that 2026 may represent a “tipping point” in the frequency and severity of clay-related ground movement events.

This bulletin summarises the latest climate-soil indicators, insurance trends, and research insights relevant to subsidence practitioners, insurers, engineers, and property managers.

2. Climate Signals & Soil Behaviour

2.1 Shrink–Swell Cycles Intensifying

Clay soils continue to behave like a “subterranean sponge,” swelling during periods of heavy rainfall and contracting aggressively during drought. The increasingly rapid alternation between these extremes is placing significant stress on foundations, particularly those built during the 1970s–1980s housing boom, when foundation depths were often insufficient for today's climatic variability.



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2.2 Why 2026 Is Considered a High-Risk Year

Geotechnical specialists warn that the UK is entering a period where extreme moisture fluctuations are no longer anomalies but part of a new climatic pattern. The combination of:

- Heavy winter rainfall (leading to heave),
- Forecast summer drought, and
- Long-term soil moisture deficits comparable to 2018 and 2022, is expected to produce a surge in shrink–swell movement later this year.

3. Subsidence Trends & Insurance Indicators

3.1 Claims Data

Subsidence-related insurance claims reached £153 million in the first half of 2025, with nearly 9,000 households affected and an average payout of £17,264. This continues the pattern of post-drought claim spikes seen in previous surge years.

Insurers are increasingly using satellite-derived ground-movement data to re-categorise risk zones, with some historically “safe” postcodes now being reassessed. Premium volatility is expected to increase through 2026.

3.2 Surge Years: A Pattern Emerging

Industry analysis highlights three recent “surge years” driven by extreme heat and drought:

- 2018 – Widespread clay shrinkage following prolonged heat.
- 2022 – Record-breaking temperatures exceeding 40°C in parts of the UK.
- 2025 – Soil moisture deficits mirroring 2018 and 2022, setting the stage for delayed damage into 2026.

These surges are increasingly linked to climate-driven extremes rather than isolated weather events.

4. Sector Impacts

4.1 Residential & Commercial Property

Subsidence is now considered a portfolio-wide risk, affecting residential, commercial, industrial, and educational buildings alike. The British Geological Survey continues to identify shrink–swell clay, inadequate foundations, and tree proximity as the leading causes of financial loss.

4.2 Business Continuity

For organisations managing multiple properties, subsidence is no longer just a repair cost issue. It is increasingly a business continuity risk, with implications for:

- Service charge budgets
- Occupant disruption
- Long-term asset value
- Insurance availability and affordability

... continued



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5. Trees, Vegetation & Urban Pressures

Tree-related moisture extraction remains a significant contributor to clay shrinkage, particularly in London and the Southeast. Urban areas with high tree density and older building stock continue to show elevated claim frequencies.

The combination of urban heat island effects and mature tree canopies is expected to exacerbate soil desiccation during the coming summer.

6. Engineering & Risk Management Insights

6.1 Foundation Vulnerability

Many homes built in the late 20th century were not designed for today's extreme shrink–swell cycles. Engineers warn that foundation depths and construction standards from that era are increasingly mismatched to modern climatic conditions.

6.2 Proactive Measures

Professionals are encouraged to:

- Review tree management strategies
- Monitor soil moisture deficits through spring and summer
- Prioritise early investigation of cracking following drought
- Engage with insurers early where risk reclassification is likely

These measures align with the industry's shift toward proactive resilience rather than reactive repair.

7. Industry Events & Research

7.1 Specialist Subsidence Conference – April 2026

This year's ILC Specialist Subsidence Conference will focus on the climate–subsidence link, surge-year patterns, and innovations in claims management. The event is expected to draw significant attention given the heightened risk outlook for 2026.

7.2 Research Themes to Watch

- Satellite-based ground movement monitoring
- Predictive modelling of shrink–swell cycles
- Climate-adjusted foundation design standards
- Urban tree management optimisation

... continued



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8. Outlook for Summer 2026

If current projections hold, the UK may experience another high-impact subsidence season. The combination of:

- Persistent soil moisture deficits,
- Increasingly volatile rainfall patterns, and
- Ageing building stock on clay soils,

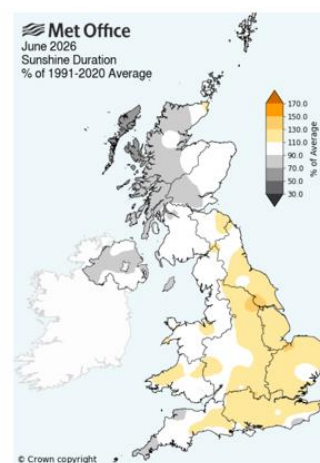
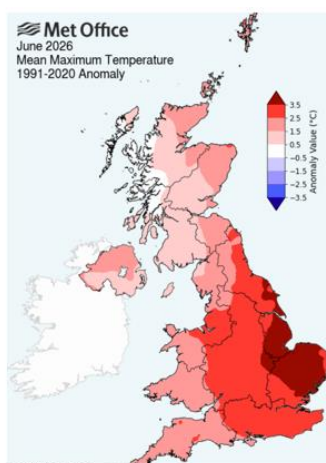
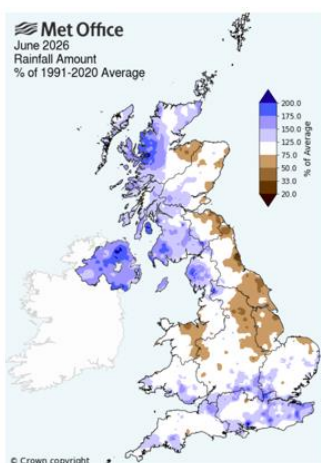
suggests that the industry should prepare for elevated claim volumes and more complex engineering interventions.

If you'd like, I can also produce:

- A shorter “editor’s summary” for the front page
 - A graphics-ready version with charts or soil-moisture maps
 - A localised Leicester/Midlands risk section tailored to your readership
 - A version matching the exact formatting conventions of previous Clay Research Group PDFs
-

Met Office Anomaly Maps for June 2026

Anomaly maps from the Met Office web site for the month of June 2026 comparing data with the 1991 – 2020 average reproduced below. The weather has been significantly warmer to the SE with slightly longer sunshine duration.



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Royal Sun and Alliance Insurance Ltd v London Borough of Harrow

Thanks to Keiron Hart for notification of a recent legal case involving Council trees.

The Royal Sun and Alliance insurance company successfully sought the removal of a tree in the ownership of Harrow Council that had caused subsidence damage to 41 Brookhill Avenue, Harrow. The tree was protected by a Tree Preservation Order, and Harrow had initially refused to take action

In May, 2026 the Upper Tribunal (Lands Chamber) confirmed that local authorities can be held liable for legal costs in Tree Preservation Order (TPO) compensation claims. The London Borough of Harrow was ordered to pay £30,000 in compensation and the insurer's legal costs.

In an earlier case, (*Burge v South Gloucestershire Council*), the Court of Appeal ruled that local authorities are not automatically liable for damage caused by a protected tree. Defences might include (a) the damaged property was defective and/or (b) if the homeowner could reasonably have foreseen a potential for damage and taken action to mitigate their loss.

In this case, Harrow argued that the Upper Tribunal lacked the legal jurisdiction to award legal costs. The Tribunal dismissed the council's argument.

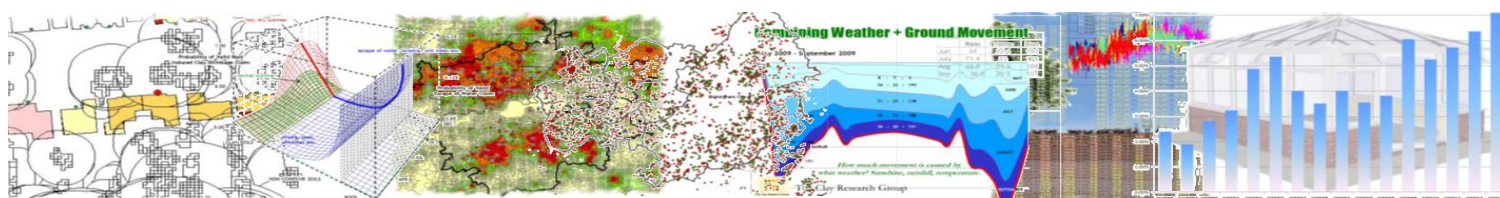
It ruled that refusing TPO consent resulted in "injurious affection of land," empowering the Tribunal to order the council to pay the claimant's costs.

ABI Report Record Claims

The average household subsidence claim was also up year-on-year – rising 9% from £16,295 in 2025 to £17,820 in the first quarter of 2026.

The mean temperature recorded by the Met Office for England was 17.1°C – a 2.2°C increase on the anomaly values for the period 1991 – 2020.

Recent articles in the CRG newsletter have mentioned the difficulty in predicting the future in terms of claim numbers, but many are expecting 2026 to be a surge year. The outcome may be useful in building a predictive algorithm – perhaps.

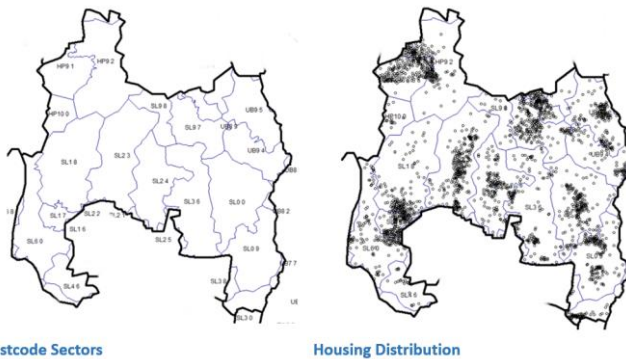


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Subsidence Risk Analysis – South Buckinghamshire

South Buckinghamshire has an area of 141.3km² and a population of around 70,200.

South Buckinghamshire



Distribution of postcode sectors and housing stock using full postcode as a proxy. Each sector covers around 3,000 houses on average across the UK and full postcodes include around 15 – 20 houses on average, although there are large variations.

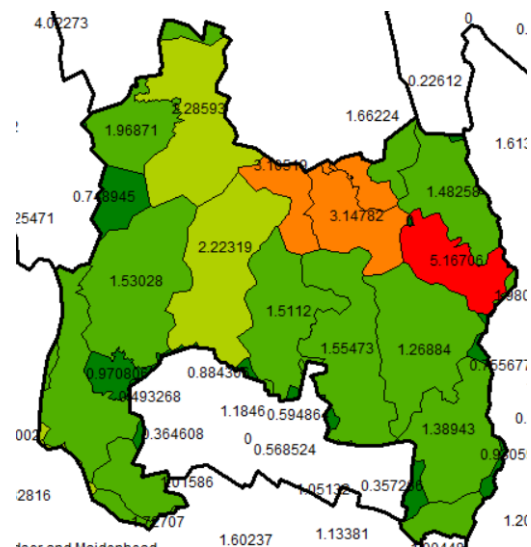
In terms of risk, South Buckinghamshire is rated 39th out of 413 districts in the UK from the sample analysed and is around 1.869x the risk of the UK average, or 0.484 on a normalised 0 - 1 scale.

From the sample we hold, sectors are rated for the risk of domestic subsidence compared with the UK average – see map, right.

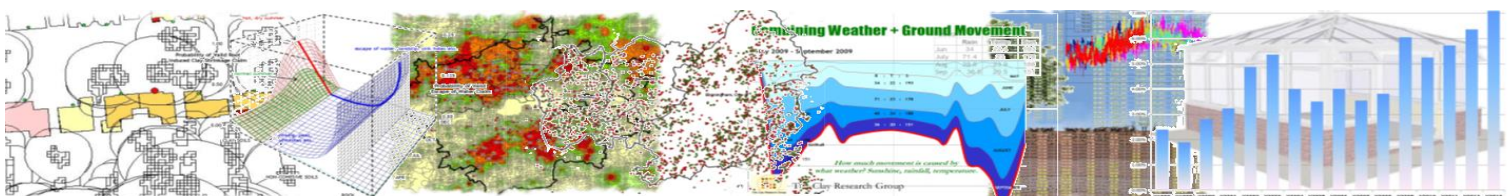
Sector and housing distribution across the district (left, using full postcode as a proxy) helps to clarify the significance of the risk maps on the following pages. Are there simply more claims in a sector because there are more houses?

Using a frequency calculation (number of claims divided by private housing population) the relative risk across the borough at postcode sector level is revealed, rather than a 'claim count' value.

Subsidence Risk Compared to UK Average

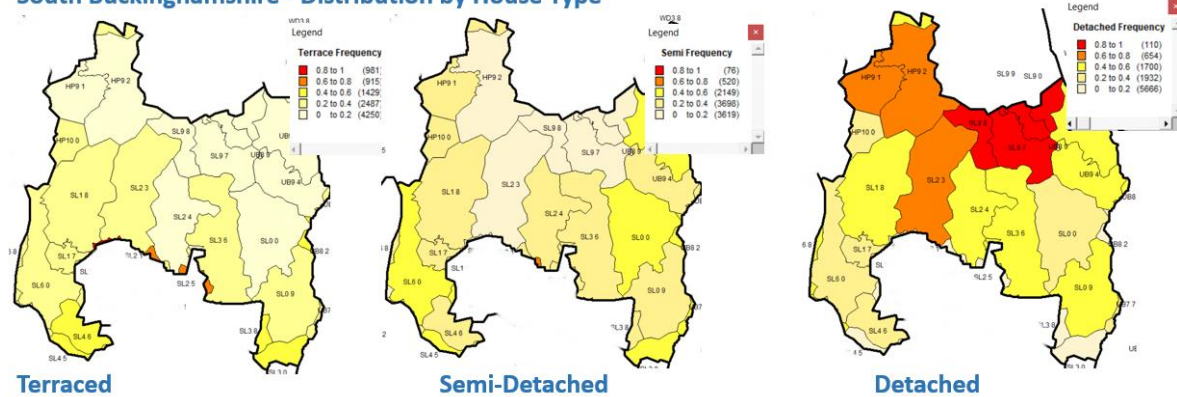


Sector risk compared to UK average from the sample analysed.



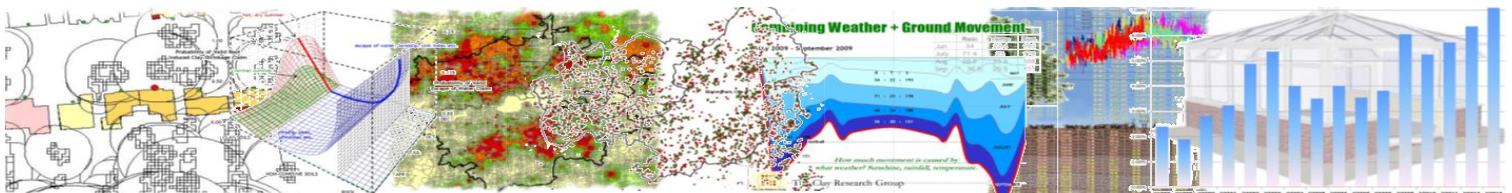
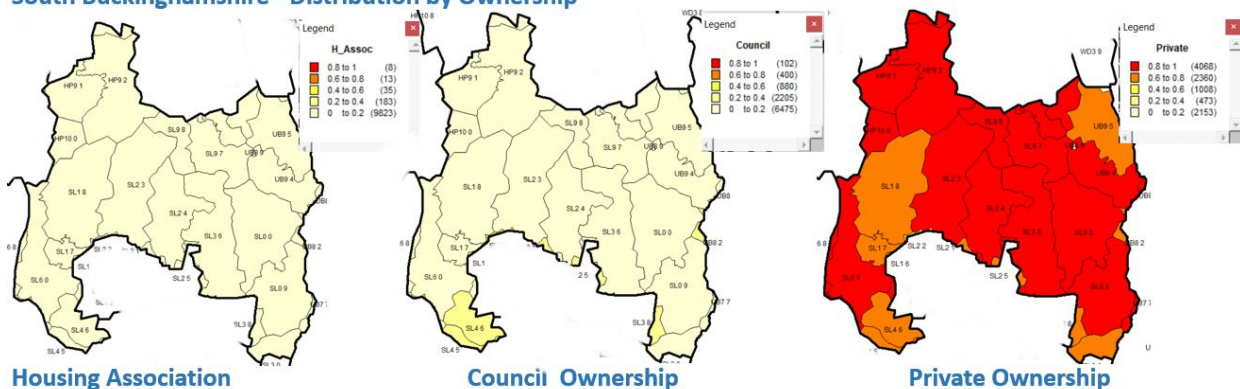
Risk increases with age of property and the model can be further refined if this information is provided by the homeowner at the time of taking out the policy.

South Buckinghamshire - Distribution by House Type



Distribution by ownership is shown below. Detached, private properties are the dominant class across the district.

South Buckinghamshire - Distribution by Ownership



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Subsidence Risk Analysis – South Buckinghamshire

Below, extracts from the British Geological Survey low resolution 1:625,000 scale geological maps showing the solid and drift series. View at:

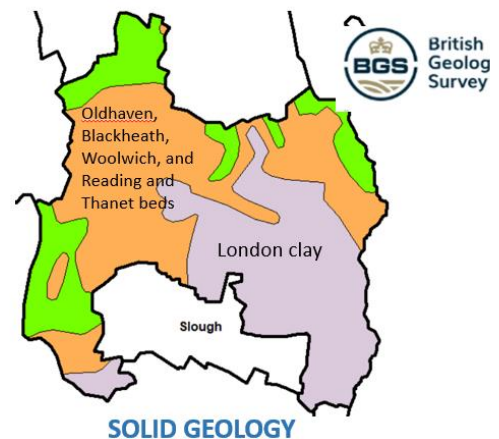
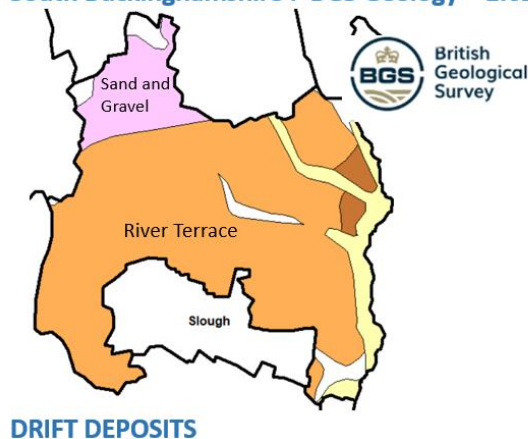
<http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

See page 12 for a seasonal analysis of the sample which reveals that, at district level, from the sample held, there was around a 63% probability of a claim being valid in the summer and, of the valid claims, there is a 63% probability that the damage will have been caused by clay shrinkage.

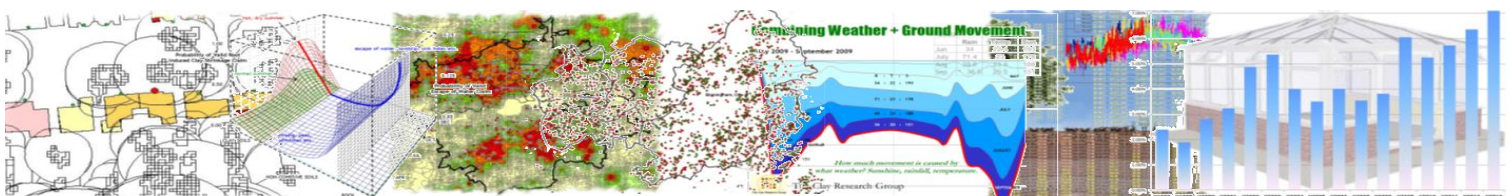
In the winter, the likelihood of a claim being valid is about the same, and of the valid claims, around 63% were attributable to an escape of water.

The geology comprises small areas of drift deposits of River Terrace and Sand and Gravel overlying a solid geology of London clay and Oldhaven, Blackheath, Woolwich, and Reading and Thanet beds.

South Buckinghamshire : BGS Geology – 1:625,000 scale

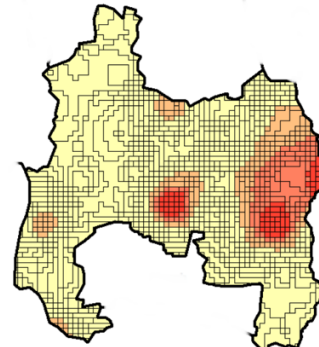
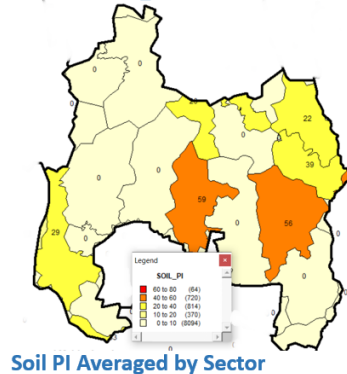


*Extracts from the 1:625,000 series British Geological Survey maps.
Working at postcode sector level and referring to the 1:50,000 series
delivers far greater benefit when assessing risk.*



Below, the average PI by postcode sector (left) derived from site investigations where undertaken and interpolated to develop the CRG 250m grid (right).

South Buckinghamshire – Soil Plasticity Index

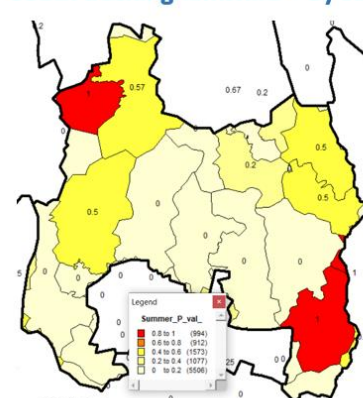


PI Interpolated on 250m CRG grid

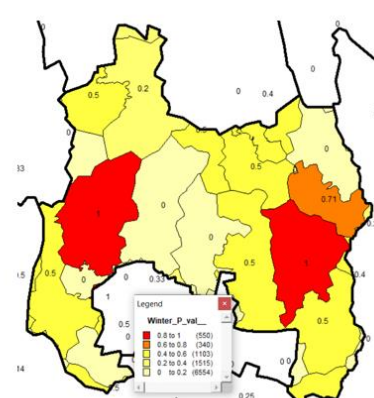
Zero values for PI in some sectors may reflect the absence of site investigation data - not necessarily the absence of shrinkable clay. A single claim in an area with low population can raise the risk as a result of using frequency estimates.

The maps below show the seasonal difference from the sample used. Combining the risk maps by season and reviewing the table on page 12 is perhaps the most useful way of assessing the potential liability, likely cause and geology using the values listed.

South Buckinghamshire – by season

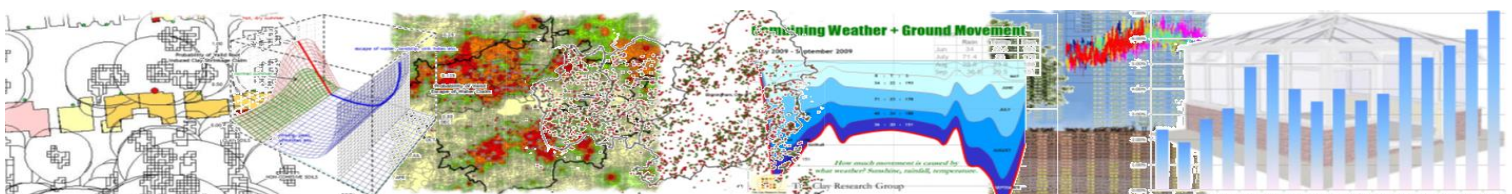


Probability Valid, Summer



Probability Valid, Winter

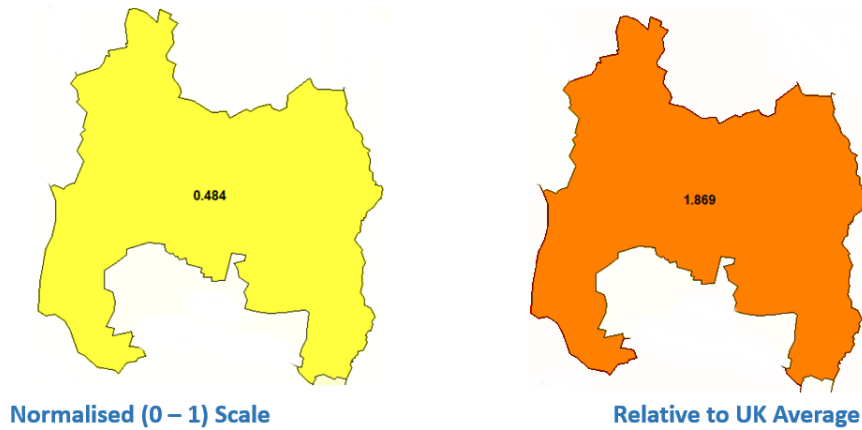
A high frequency risk can be the product of just a few claims in an area with a low housing density of course and claim count should be used to identify such anomalies.



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District Risk. EoW and Council Tree Risk.

South Buckinghamshire - Subsidence Risk Relative to UK

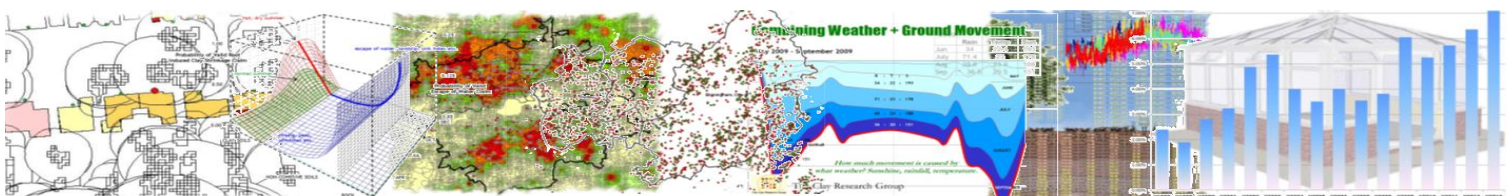
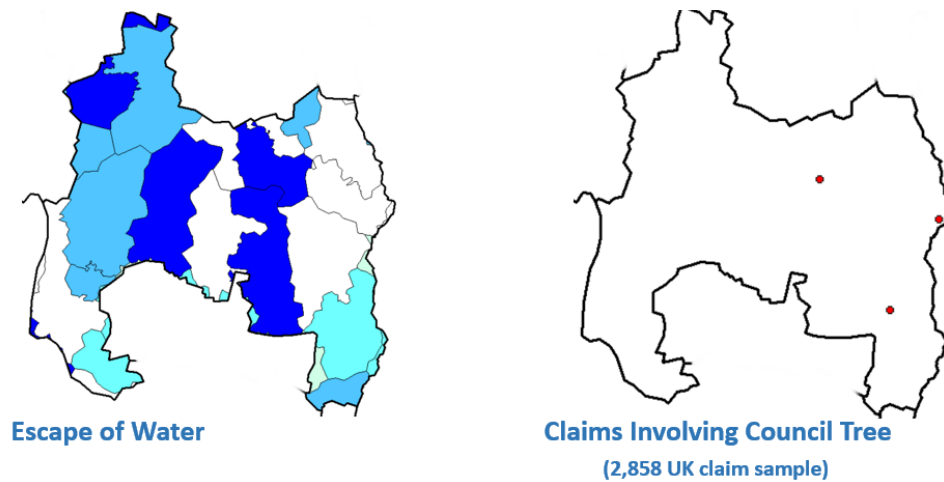


Below, left, mapping the frequency of escape of water claims reflecting the nature of the underlying soil.

As we would expect, the 1:50,000 scale BGS map provides a more detailed picture. The CRG 1:250 grid reflects claims experience.

Below right, map plotting claims where damage has been attributable to vegetation in the ownership of the local authority from a sample of around 2,858 UK claims.

South Buckinghamshire

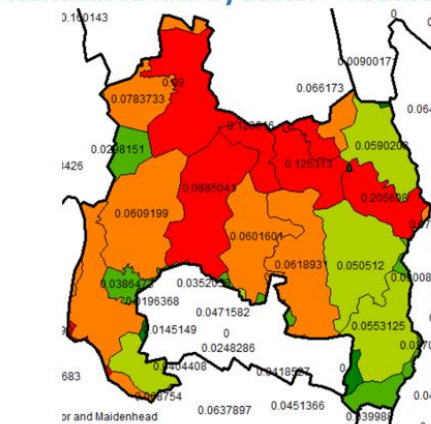


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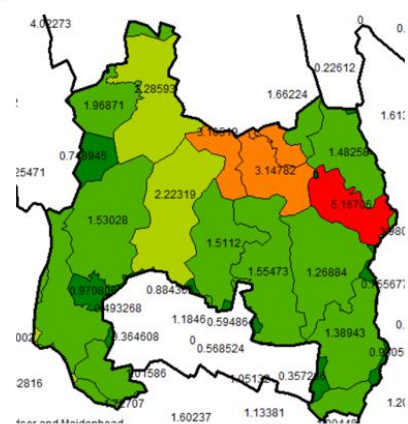
South Buckinghamshire - Frequencies & Probabilities

Below, mapping the risk of subsidence by ownership. Claims frequency that includes council and housing association properties delivers a misleading value of risk as they self-insure. The following show the normalised risk, taking account of the private housing population – that is, the rating compared with the average value for each category.

Normalised Risk by Sector – South Buckinghamshire



Normalised Subsidence Risk – scale 0 – 1



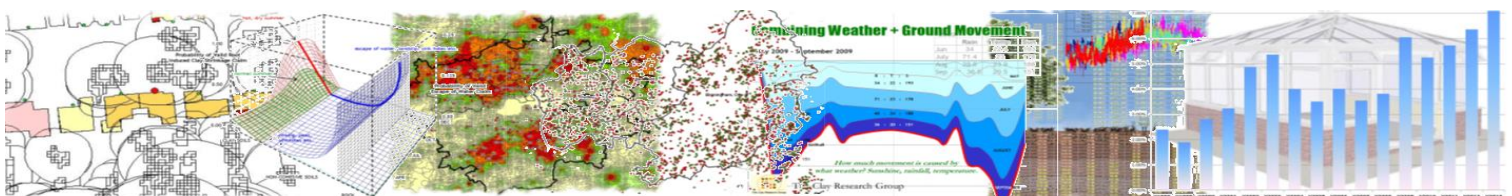
Subsidence Risk Compared to UK Average

To reiterate, a reversal of rates for valid-v-declined by season is a characteristic of the underlying geology. For clay soils, the probability of a claim being declined in the summer is usually low, and in the winter, it is high.

In this case, the values reflect the presence and influence of the underlying geology with non-shrinkable soils accounting for a higher proportion of Escape of Water claims throughout the year.

Liability by Season - South Buckinghamshire

	valid summer clay	valid summer EoW	Repudiation Rate (summer)	valid winter clay	valid winter EoW	Repudiation Rate (winter)
District						
South Bucks	0.398	0.232	0.37	0.23	0.39	0.382

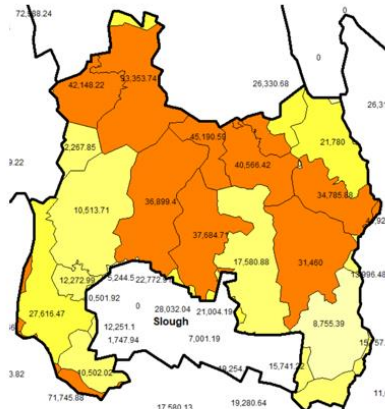


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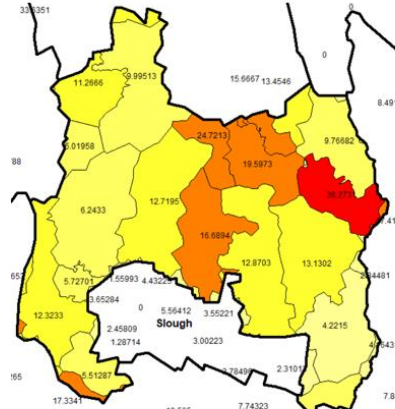
Aggregate Subsidence Claim Spend by Postcode Sector and Household in Normal & Surge Years

The maps below show the aggregated claim cost from the sample per postcode sector for both normal (top) and surge (bottom) years. The figures will vary by the insurer's exposure, claim sample and distribution of course.

NORMAL YEAR SPEND – South Buckinghamshire



Spend by Sector

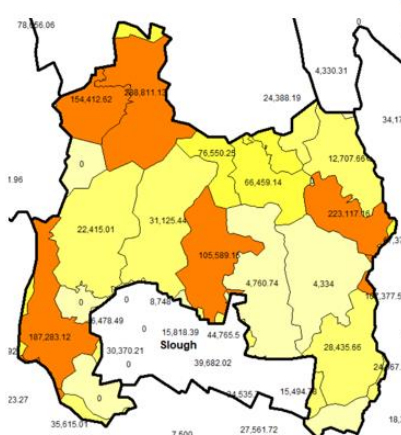


Spend Averaged Over Private Housing Population

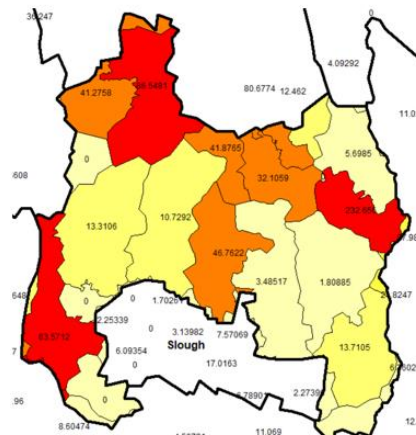
The images to the left in both examples (above and below) represent gross sector spend and those to the right, sector spend averaged across private housing population to derive a notional premium per house for the subsidence peril.

In this case, the absence of any distinct difference between surge and normal years reflects the geology.

SPEND in SURGE – South Buckinghamshire



Spend by Sector



Spend Averaged over Private Housing Population

