

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



April 2026
Issue 251

The Clay Research Group

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Subsidence Risk Analysis by District
LANCASTER

Surge Prediction 2026 using the AI Applications ChatGPT and Copilot

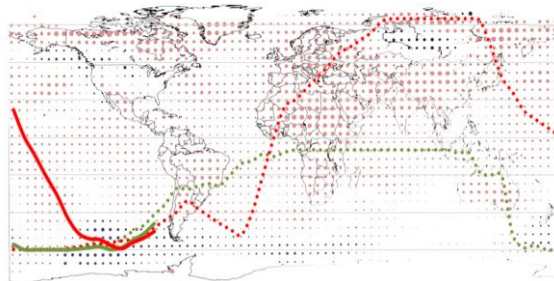
What is the likelihood of surge in 2006? The two AI systems deliver their predictions.

District and Sector Risk

Lancaster is situated to the NW of England and has an area of 241.3km² and a population around 140,000.

It is the subject of the ‘Risk by District’ series in this month’s edition. Its geology comprises drift deposits of alluvium, till and peat overlying predominantly millstone grit – see Page 11.

2003 -v- 2026 SMD for Grass and Trees
●●● GRASS 2003 ●●● TREES Yr 2003 — GRASS 2026 — TREES Yr 2026



SMD Data provided by the Met office. Tile 161, Medium Available
Water Capacity with grass and tree cover

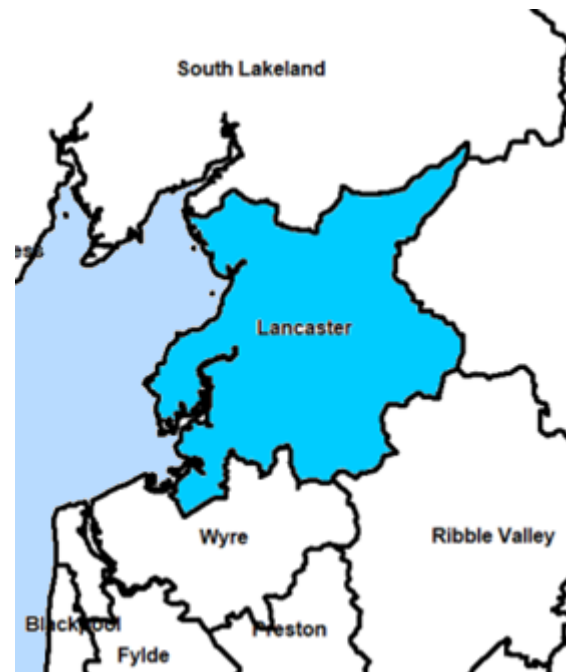
SMD graph for Met Office tile 161 plotting the correlation between the SMD for a surge year (2003) and the current year in soils with medium water capacity.

Contributions Welcome

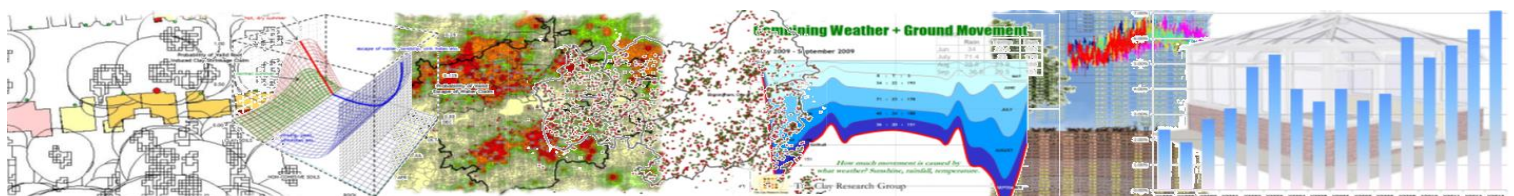
We welcome articles and comments from readers. If you have a contribution, please Email us at: clayresearchgroup@gmail.com

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



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ChatGPT



Question to ChatGPT

What is the risk of a surge in domestic subsidence claims in 2026?

Response

The risk of a **surge in domestic subsidence claims in 2026 (UK context)** is widely considered **elevated to high**, driven by a combination of recent weather patterns and longer-term climate trends. Here's a clear breakdown of why.

▲ 1) Strong leading indicators from 2025

- Subsidence payouts hit **record levels in 2025** (≈£307m, +10% YoY)
 - Early 2025 already showed **£153m in claims in just the first half**
 - Insurers explicitly described 2025 as being **“defined by subsidence claims”**
- 👉 This matters because subsidence typically **lags weather conditions**, meaning damage often emerges months after drought.

🌪️ 2) “Perfect storm” weather pattern carrying into 2026

The key driver is a **sequence of extremes**, not just one event:

- **Hot, dry periods (2025)** → soils shrink
 - Followed by **wet conditions (late 2025 / 2026)** → soils re-expand
 - This creates **ground instability and structural movement**
- This shrink–swell cycle is a well-established trigger for claim spikes .

👉 2026 risk is elevated because:

- 2025 had **record heat (Met Office)**
- Early 2026 already includes **storms and extreme weather**

🌍 3) Climate change is increasing frequency of “surge years”

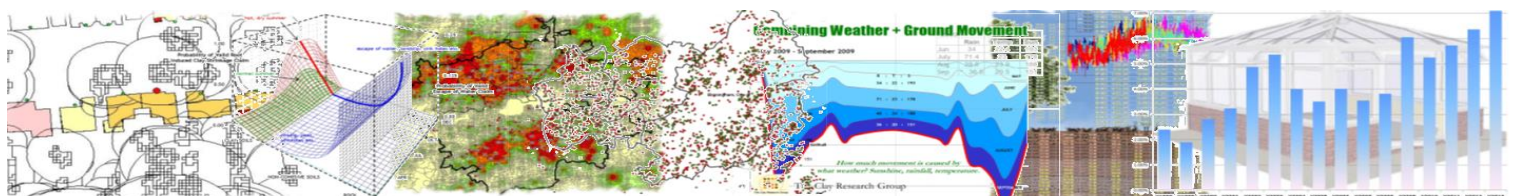
Evidence suggests subsidence is shifting from occasional to recurring:

- Weather-related claims now **double historical levels (vs 2017–2021)**
- Climate projections show **more frequent drought + intense rainfall cycles**
- Experts describe subsidence risk as **“accelerating” and portfolio-wide**

👉 Historically, major spikes followed hot summers (e.g. 2018, 2022).

👉 Those conditions are now happening **more often**, increasing surge probability.

... continued



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ChatGPT



4) Structural vulnerability in UK housing stock

Risk is amplified by underlying exposure:

- Large areas of the UK sit on **shrink–swell clay soils**
- Urban density + trees + older foundations increase stress on buildings
- Subsidence is no longer limited to “high-risk zones” — it’s becoming **nationwide exposure**

5) Forward-looking risk for 2026

Putting it together:

Likelihood of a surge in 2026: Moderate → High

- Elevated baseline (record 2025)
- Ongoing extreme weather into 2026
- Lagged claims development still emerging


Severity if it occurs: High

- Average claim ≈ £17k+
- Events can produce **clustered, systemic losses** (not isolated claims)

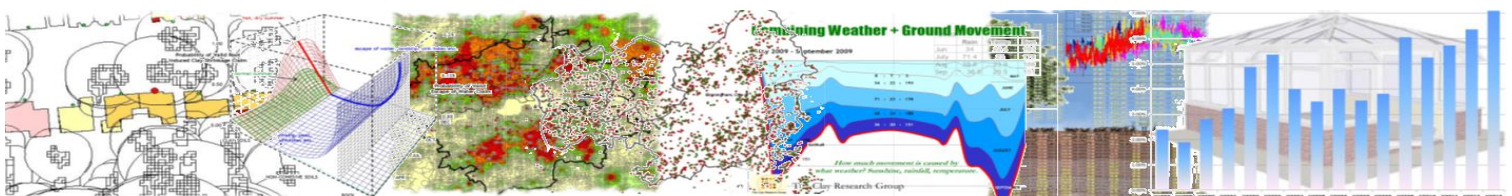
Bottom line

The risk of a surge in domestic subsidence claims in 2026 is **material and rising**, primarily because:

- The UK has just experienced **ideal precursor conditions (heat + rainfall swings)**
- Climate change is making these patterns **more frequent and intense**
- The housing stock is **highly exposed to soil movement**

 In practical terms:

Even if 2026 is not a peak “event year,” the **underlying risk level is structurally higher than in previous decades**, meaning **more frequent and costly surges going forward**.



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ChatGPT

Question to Copilot



What is the risk of a surge in domestic subsidence claims in 2026?

Response



1. 2025 Was Already a Major Surge Year

- Soil moisture data from MORECS predicted “one of the biggest subsidence surges in history” due to UK heatwaves in 2025.
- Subsidence-related insurance claims reached **£153 million in the first half of 2025 alone**.
- Industry consensus in late 2025 was that **2025 had all the hallmarks of a surge year**, driven by hot, dry summers and clay soil shrinkage.

Given that subsidence effects often lag behind weather patterns, elevated claim volumes can spill over into the following year.



Factors That Could Drive Higher Claims in 2026



Climate Trends

- The UK’s warming climate is producing more frequent and intense dry spells, which increase clay shrink-swell cycles—one of the main causes of domestic subsidence.
- Experts are actively calling for changes in how subsidence claims are handled to “futureproof homes from climate change,” signalling expectations of continued pressure on the system.



Claims Momentum

- Surge years often create backlogs and delayed reporting, meaning **claims initiated in 2025 may be processed or discovered in 2026**.
- Insurers and property managers are already warning that subsidence is becoming a “prevalent financial and operational threat,” with risk accelerating.



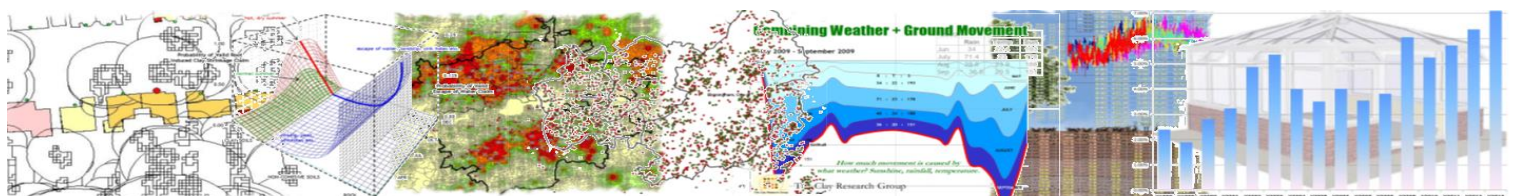
What We Don’t Know Yet

- No insurer, regulator, or industry body has formally declared 2026 a surge year.
- Subsidence surges depend heavily on **summer weather patterns**—a single wet summer can dramatically reduce risk.



Bottom Line

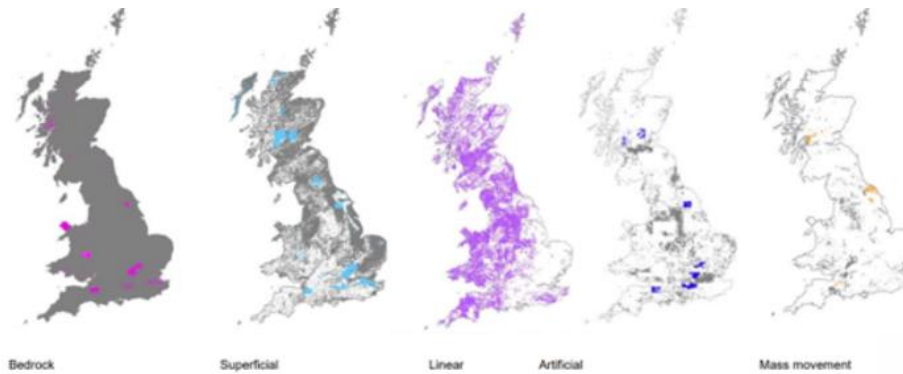
- **If 2026 experiences another hot, dry summer, a surge is very likely.** If conditions are milder, claims may stabilise—but the underlying climate-driven trend points toward more frequent surges in the coming decade.



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British Geological Survey Maps - Updates

The BGS have updated their digital geology maps. “Changes include new data and slight modifications to the dataset attribution. An overview of the changes is included with the data release and the images (see below) summarise the spatial distribution of updates between Version 8 and the new Version 9 of the 1:50 000-scale maps and between Version 2 and the new Version 3 of the BGS Geology 1:10 000 to 25 000 maps”.

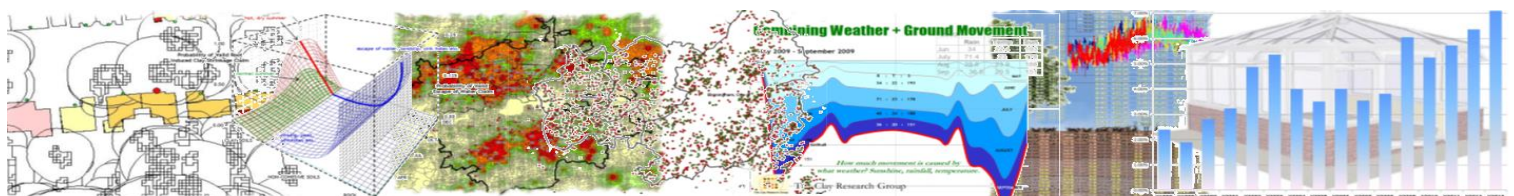
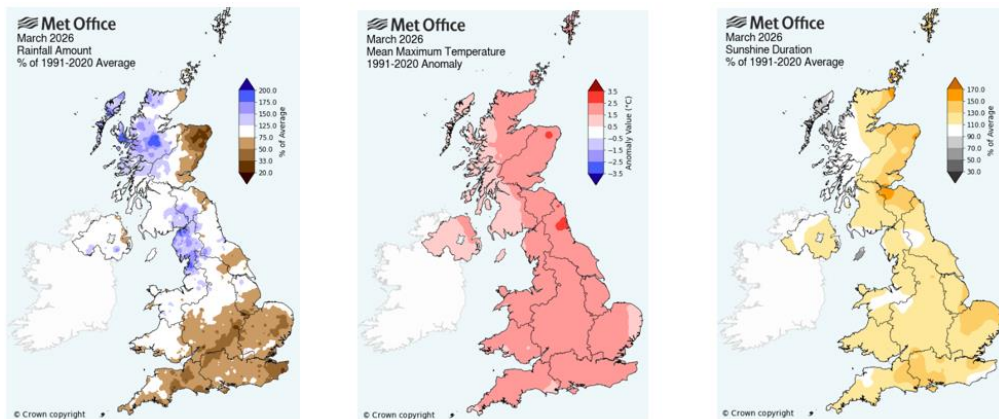


Above: Locations of new or modified content in BGS Geology 50K. Bedrock changes (pink); superficial changes (light blue); linear changes (purple); artificial changes (dark blue); mass-movement changes (brown).

<https://www.bgs.ac.uk/news/latest-bgs-geology-50k-mapping-data-launched/>

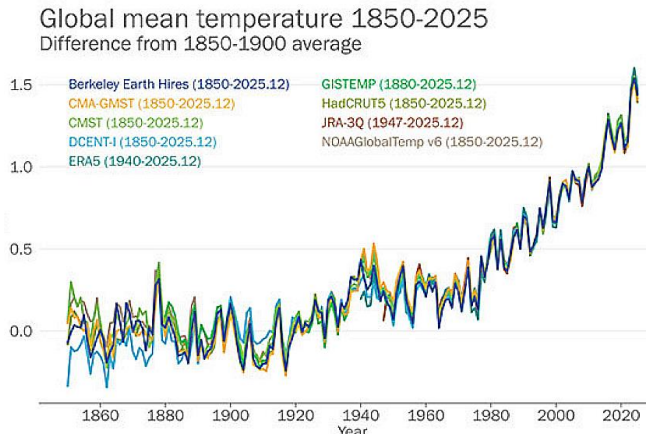
Met Office Anomaly Maps for February 2026

Anomaly maps from the Met Office web site for the month of February 2026 comparing data with the 1991 – 2020 average, reproduced below. The weather has been drier to the SE and warmer with longer sunshine duration across the UK.



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Global Warming Update



The past 11 years (2015–25) have been the hottest on record, with last year being the third-warmest year since observations began according to most data sets, finds a report released on 23 March by the World Meteorological Organization (WMO).

Global surface temperatures were slightly lower in 2025 than the previous year — the hottest on record.

Their findings conclude “2025 was the second or third hottest year on record, at about 1.43 °C above the 1850-1900 average.”

<https://wmo.int/publication-series/state-of-global-climate/state-of-global-climate-2025>

Vienna Conference - Electrokinetic Stabilisation (EKS)

Richard Rollit and Allan Tew of Innovation Group are attending the Proceedings of the 21st International Conference on Soil Mechanics and Geotechnical Engineering, to be held in Vienna on June 16 – 19th, 2026.

They are joining a team from Birmingham University who are delivering a paper describing their work and the results of a practical application of the technique to stabilize a property damage by root induced clay shrinkage in Bristol.

The method was installed in 2018 involving inserting rows of electrodes powered by solar panels. No movement has been recorded since and the PI has reduced from 40% to 8%.



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Ombudsman’s Decisions Relating to Foundation Depth

The two cases below illustrate the Ombudsman’s view relating to subsidence damage in cases where the foundation depths were not considered adequate by insurers and claims were declined.

DRN-5602026 – Declinature Not Upheld

The homeowner made a claim for damage to a conservatory. Investigations revealed the damage to be due to root induced clay shrinkage. Insurers declined the claim explaining that the foundations didn’t comply with standards that existed at the time of construction. Had they complied, the damage would not have occurred. The claim was declined under the faulty workmanship section of the policy.

The Ombudsman disagreed with the declinature on the basis that the required foundation depth at the time of construction was 750mm. *“While the foundations of the conservatory were found to be at 300mm, investigations revealed the roots to be at 1000mm below ground level. So even if they had been built to the recommended depth the damage would have still occurred.”*

The Ombudsman upheld the homeowner’s complaint on the basis that *“the insurer has referenced guidance from a provider of building warranties. The policy doesn’t set out any requirement to adhere to these standards.”*

This is an interesting point illustrating that non-compliance with a non-statutory requirement (the NHBC tables, work by Giles Biddle and numerous other experts for example) rather than a statutory requirement (the Building Regulations) isn’t a valid reason for a declinature.

Amongst other reasons, the Ombudsman also explained *“it was estimated to have been built around 30 years before the subsidence happened and there is no information available which confirms what vegetation was in place at the time and therefore what depth the foundation should have been built at.”*

DRN-5642576 – Declinature Upheld

Homeowner had an extension built in 2019 and cracks appeared in 2020. Insurers declined the claim because they thought the damage was due to thermal movement and in any event, the foundations were not considered adequate.

... continued



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The homeowner engaged a solicitor and an engineer. An appointed arborist concluded that the damage was subsidence and the cause was a neighbor’s tree.

Enquiries by the insurer revealed that the extension had not received final certification from the Local Authority, whose records revealed that the foundations should have been 1.4m deep to take account of the soil type and tree species. The foundations were in fact only 1m deep.

The homeowners disagreed on the basis their engineer and builder were both of the view the foundation depth was adequate.

The Ombudsman says: *“They said they received verbal confirmation from the LA that the foundations and work were acceptable - and would’ve been inspected after completion of the work. They said there was no evidence in any of the engineer’s reports that supported the extension was constructed poorly or in breach of any building standards – and pointed out the standards referenced by our investigator were not legal or regulatory requirements.”*

In his view, the short timescale of damage appearing following construction pointed to an inadequate foundation depth. The suggestion that the Local Authority gave verbal approval was at odds with a System Screenshot provided by the Local Authority confirming that a foundation depth of 1.4m was required.

The Ombudsman concluded *“If the foundations were adequate at 1m, I’d have expected them to have lasted the test of time. But they haven’t, the issues have presented themselves almost instantly - so I think it’s more likely than not the foundations weren’t sufficient”*, and came to the conclusion not to support the homeowner’s complaint.



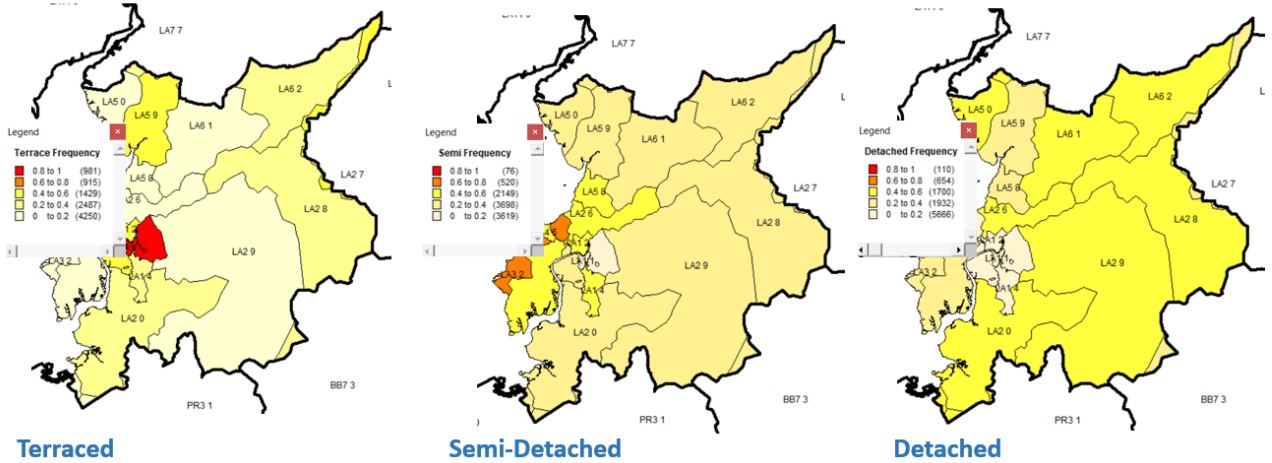
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Lancaster - Properties by Style and Ownership

Below, the general distribution of properties by style of construction, distinguishing between terraced, semi-detached and detached. Unfortunately, the more useful data is missing at sector level – property age.

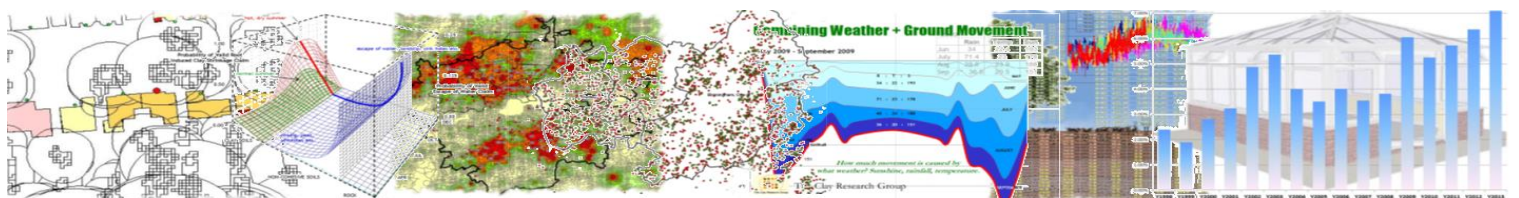
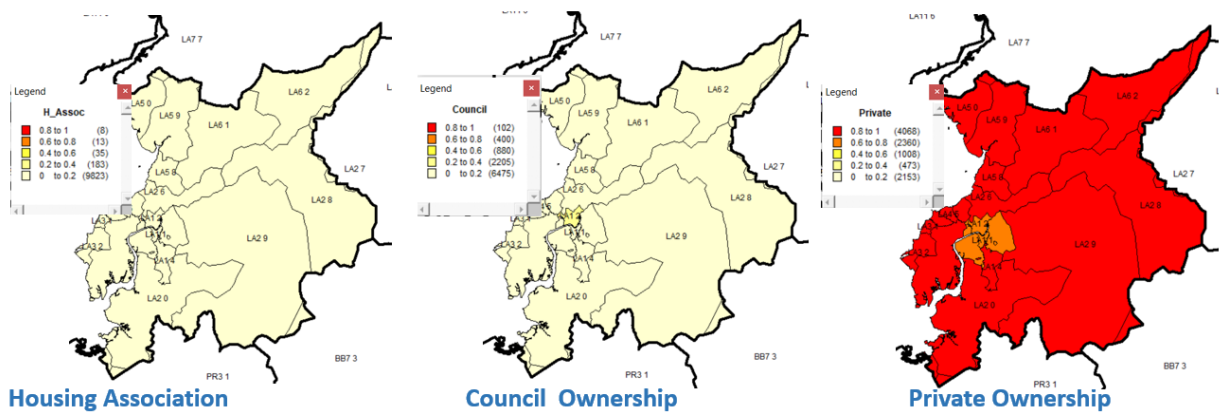
Risk increases with age of property and the model can be further refined if this information is provided by the homeowner at the time of taking out the policy.

LANCASTER - Distribution by House Type



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

LANCASTER - Distribution by Ownership



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Subsidence Risk Analysis – Lancaster

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

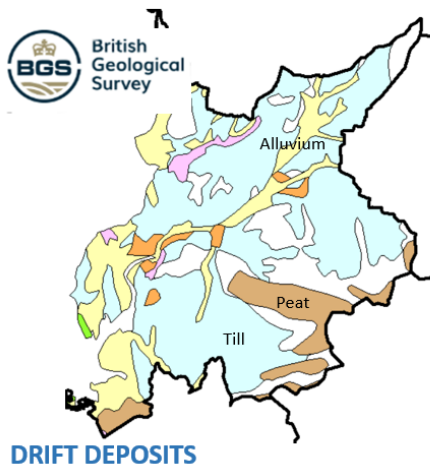
<http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

See page 14 for a seasonal analysis of the sample which reveals that, at district level, there is around a 30% probability of a claim being valid in the summer and, of the valid claims, there is a 90% probability that the damage will have been caused by escape of water.

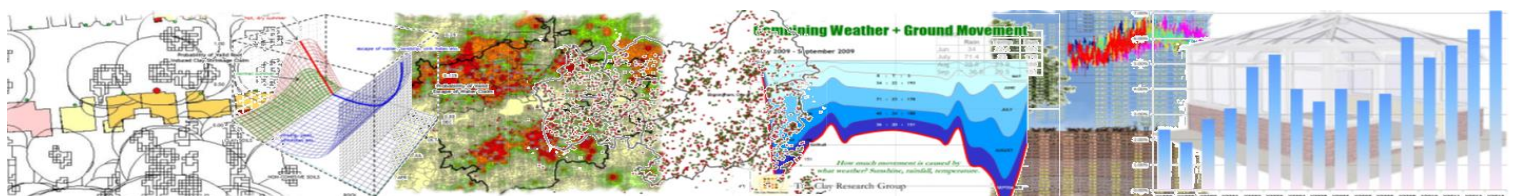
In the winter, the likelihood of a claim being valid is around 70% and of the valid claims, more than 90% are attributable to an escape of water.

Site investigations undertaken relating to claims suggests the limited presence of clay soils in the superficial limestone deposits (see following page). We have no site investigation data for the area indicating the significant presence of clay soil.

LANCASTER : 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.

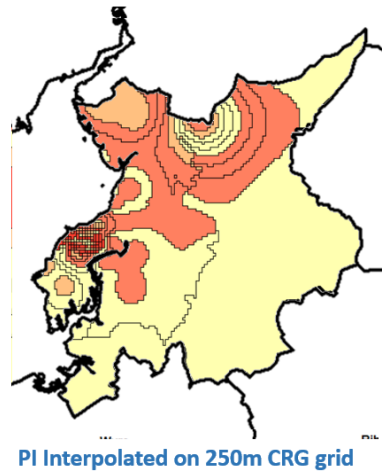
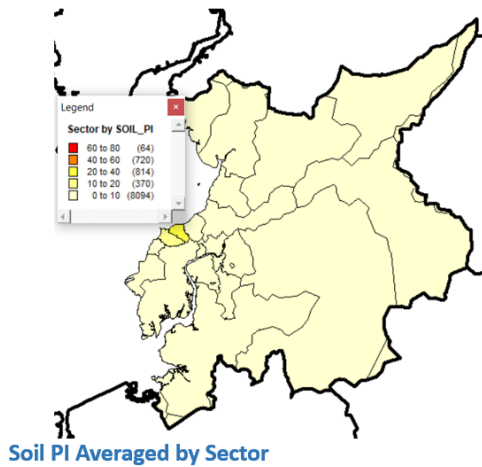


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Liability by Geology and Season

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

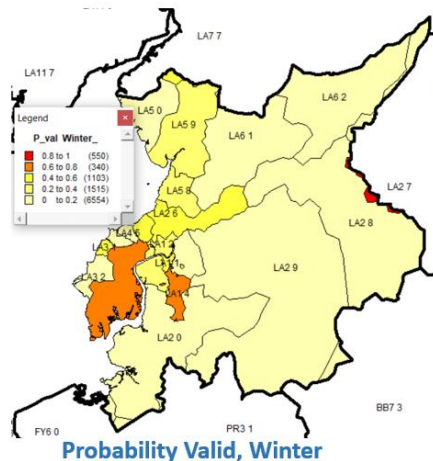
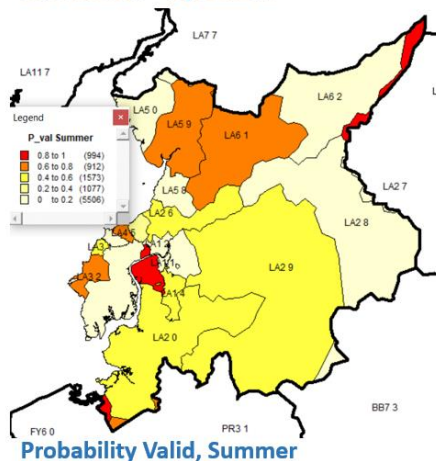
LANCASTER – Soil Plasticity Index



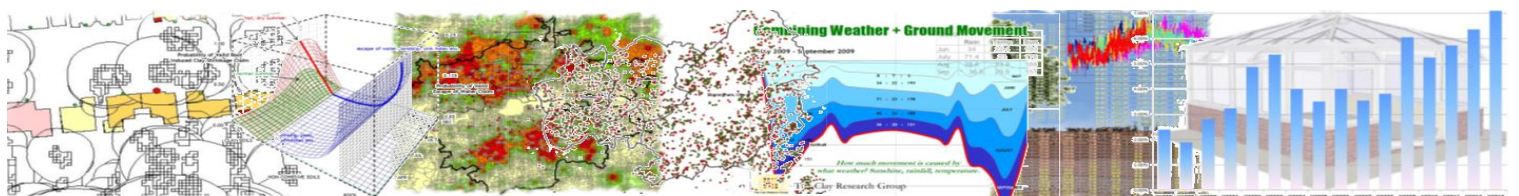
Zero values for PI in some sectors may reflect the absence of site investigation data - not necessarily the absence of shrinkable clay. A single claim in an area with low population can raise the risk as a result of using frequency estimates.

The maps below show the seasonal difference from the sample used. Combining the risk maps by season and reviewing the table on page 14 is perhaps the most useful way of assessing the potential liability, likely cause and geology using the values listed.

LANCASTER – by season



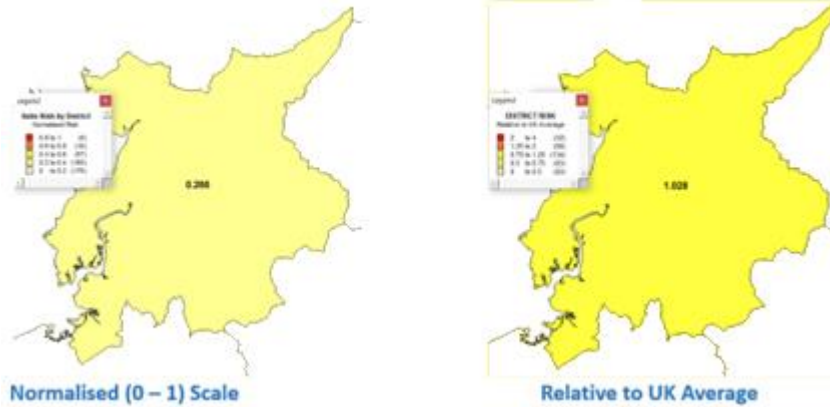
A high frequency risk can be the product of just a few claims in an area with a low housing density of course and claim count should be used to identify such anomalies.



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District Risk. EoW and Council Tree Risk.

LANCASTER - Subsidence Risk Relative to UK

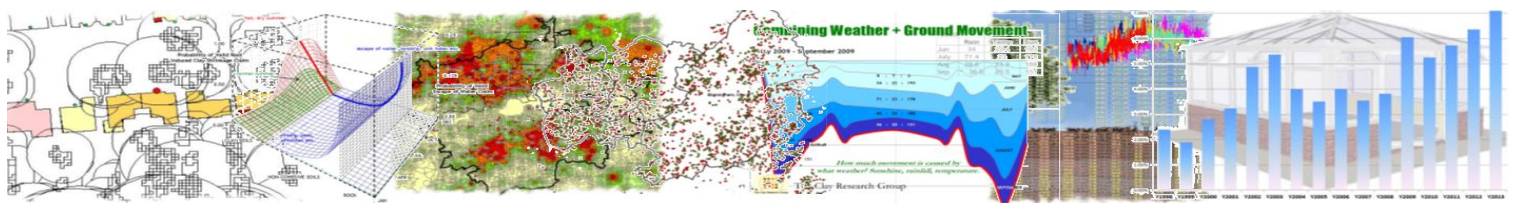
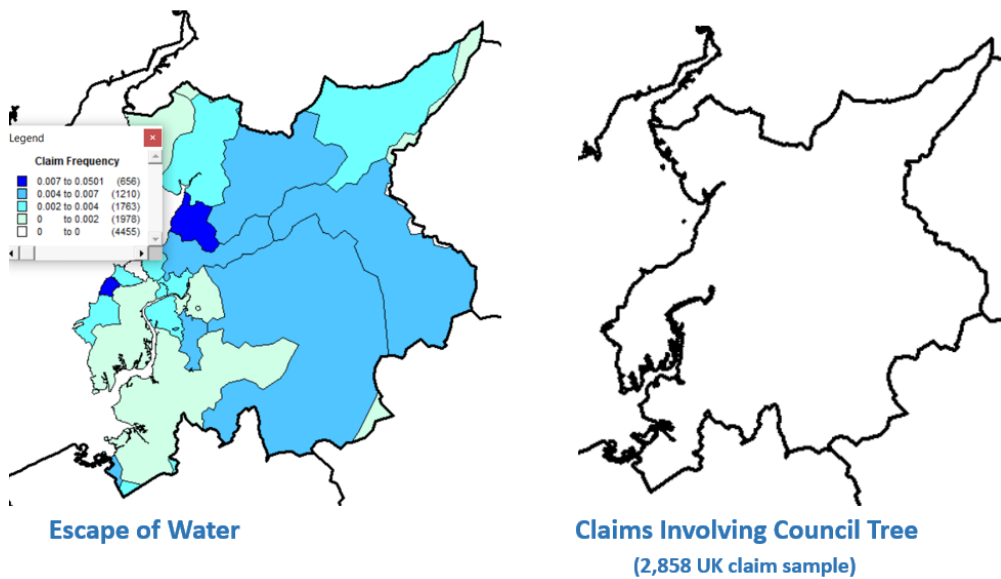


Below, left, mapping the frequency of escape of water claims reflecting the presence of drift deposits.

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 confirming the presence of shrinkable clay soils – or, in this case, the absence.

LANCASTER

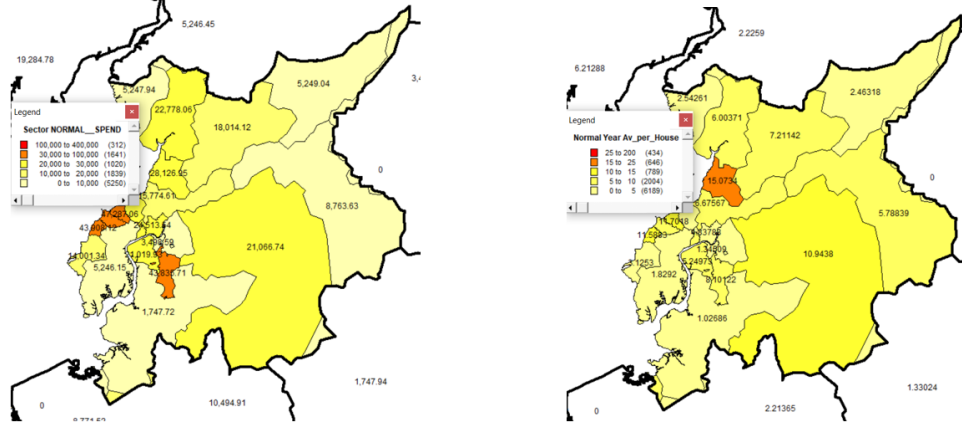


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Aggregate Subsidence Claim Spend by Postcode Sector and Household in Normal & Surge Years

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.

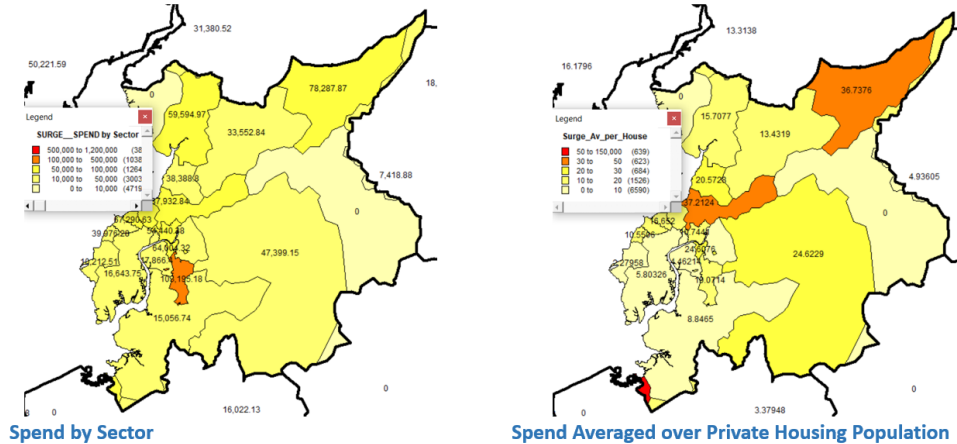
NORMAL YEAR SPEND – LANCASTER



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 – LANCASTER



Spend by Sector

Spend Averaged over Private Housing Population

