

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



June 2026
Issue 253

The Clay Research Group

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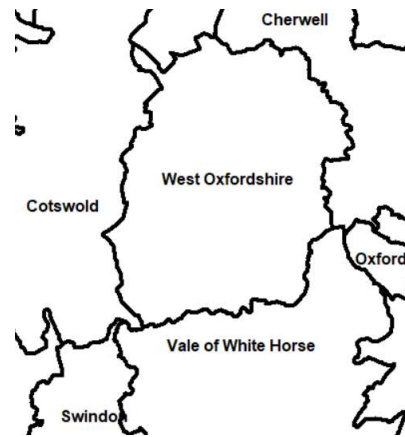
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Subsidence Risk Analysis by District West Oxfordshire

District and Sector Risk

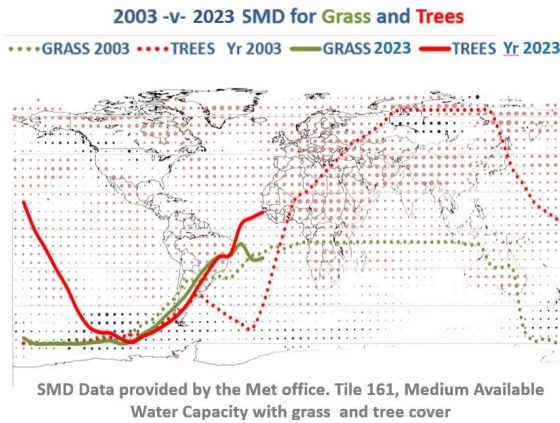
West Oxfordshire has an area of 714.4km² and a population of around 121,000.

It is the subject of the 'Risk by District' series in this month's edition. Its geology comprises small areas of drift deposits of River Terrace and Alluvium overlying a solid geology of Lias, Oolite and Oxford clay – 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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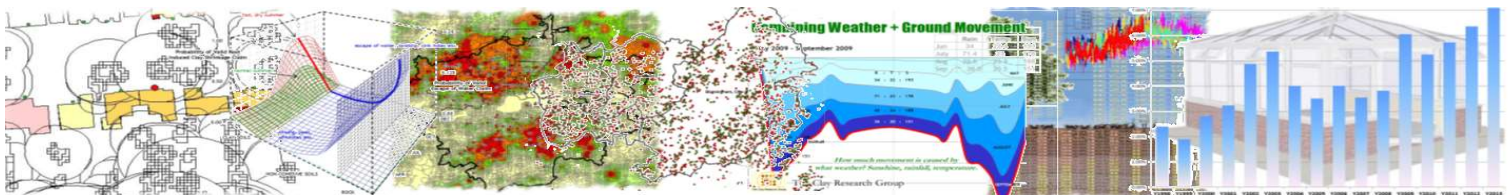
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British Geological Survey Update - GeoClimate

The BGS have announced a significant update to their numerous data applications with GeoClimate, a 1:50,000 scale digital map delivering "information on the projected future change in susceptibility of clay shrink-swell across Great Britain due to climate change." for the period 2065 – 2075. For further details visit their web site at:

<https://www.bgs.ac.uk/datasets/geoclimate-shrink-swell/>



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Gemini Applies to Produce CRG Newsletter

Keith Torrance, Claims Consultant, has provided samples from four AI systems (Gemini, Claude, Perplexity and CoPilot) revealing how they might approach putting together a monthly newsletter – can AI replace the current method? Below is the response from Gemini obtained by Keith for April.

Question to Gemini



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

While I cannot browse to the specific live newsletters at the URL provided to mirror the exact layout, the Clay Research Group (CRG) is well-known in the UK engineering and insurance sectors for its focus on soil mechanics, tree-root interactions, and subsidence risk. Drawing from the CRG's typical data-driven and analytical style, here is a draft for a forthcoming bulletin focused on the current trends of 2026.

The Clay Research Group Bulletin

Edition 226 | April 2026

1. 2025 Retrospective: The "Warm-Wet" Anomaly

As we close the books on the 2025 surge data, a distinct pattern has emerged. Unlike the classic "heatwave surge" of 2022, 2025 was characterized by prolonged high temperatures paired with intermittent, heavy rainfall.

- **The Data:** Soil Moisture Deficits (SMD) remained high throughout the autumn, leading to a late-season spike in claims.
- **The Impact:** We observed a higher-than-average frequency of "recovery movement" claims, where structures reacted more violently to the rapid rehydration of desiccated London Clay.

... continued



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2. Soil Moisture Monitoring: The 2026 Outlook

Early readings for Spring 2026 indicate that water tables are at "Normal" to "High" levels across much of the South East. However, the **CRG Risk Model** suggests a high sensitivity to any sustained dry spell starting in May.

- **Current SMD:** Currently hovering near 10–20mm across most UK clay zones.
- **Predictive Analysis:** If we experience a 15% decrease in average May rainfall, we anticipate a transition to a "Category 2" (Moderate) risk year by July.

3. Research Update: Tree Species and Root Physiology

A recurring theme in recent litigation and mitigation is the "root-specific" influence on moisture abstraction. Our ongoing collaboration with arboricultural experts suggests that we must move beyond simple distance/height ratios.

Key Finding: Recent telemetry from our Aldenham site indicates that *Quercus robur* (English Oak) maintains significant moisture abstraction even during high-humidity periods, whereas *Fraxinus* (Ash) species show a marked decline in transpiration when leaf-stress thresholds are met early in the season.

Implications for Adjusters: When assessing "Total vs. Partial" removal, the species-specific physiological response to localized climate conditions should be a primary factor in the mitigation recommendation.

4. Tech Corner: Remote Sensing & Ground Saturation

We are pleased to announce the integration of high-resolution **InSAR (Interferometric Synthetic Aperture Radar)** data into our monthly risk mapping.

By overlaying InSAR millimetre-level ground movement data with our existing soil maps, we can now identify "hotspots" of subsidence before physical cracking is reported by the homeowner. This "Proactive Claims Management" approach aims to reduce the remedial cost by intervening while the movement is still in its elastic phase.



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5. Case Study: The "Double-Story" Extension Dilemma

A recent case in North London highlighted the dangers of non-uniform foundation depths.

- **Scenario:** A Victorian terrace on shallow footings was extended in 2021 with a deep-trench foundation.
- **The Problem:** During the dry spell of late 2025, the original house subsided due to clay shrinkage, while the extension remained stable. The resulting "shear" at the junction led to significant structural failure.
- **CRG View:** This reinforces our stance that **differential movement** is often a greater risk than uniform subsidence. Flexible jointing remains the most cost-effective preventative measure in clay zones.

6. Intelligence & Industry News

- **Financial Conduct Authority (FCA):** New guidelines are expected regarding "fair value" in subsidence repairs, likely pushing for more sustainable, carbon-neutral repair methods over traditional mass-pour underpinning.
- **Tree Officer Engagement:** The CRG continues to advocate for a streamlined "Joint Mitigation Protocol" to speed up the local authority tree removal process in high-risk zones.

Contact the Editor For data inquiries or to contribute a case study to the next edition, please contact the CRG team via the portal.

The Clay Research Group is a non-profit organization providing data and research to the insurance and engineering sectors to improve the management of subsidence.



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Predicting the Future – will 2026 be Surge Year?

There is little doubt most of us are expecting a surge in subsidence claims resulting from the strong chance of El Niño developing between May and July this year from the National Oceanic and Atmospheric (NOAA) review and the recent record levels of recorded temperature. NOAA suggest *“there is a strong chance of an El Niño developing between May and July this year, but there is much uncertainty over its peak strength.”*

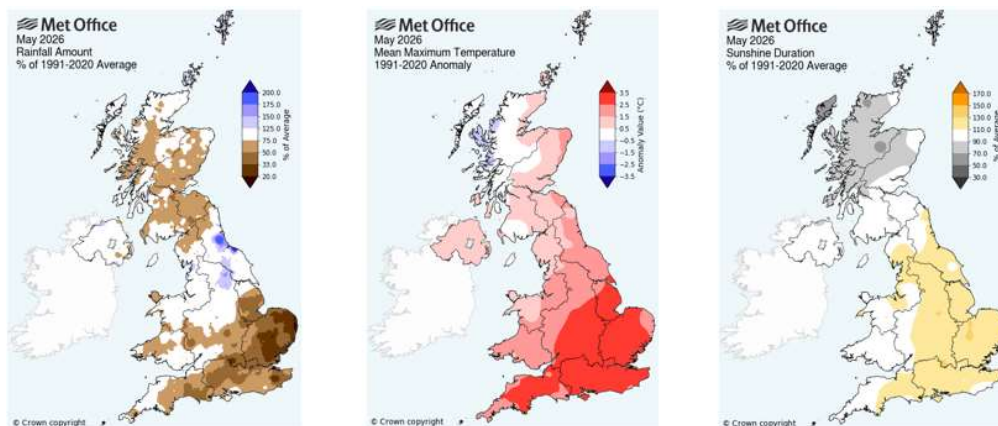
Record temperatures and several articles in the press reference the threat of extreme dry weather in the second half of the current year and possibly extending into 2027. The Met Office report that Spring 2026 has been *“the warmest on record in the UK”* with *“many stations recorded their highest May daily maximum temperatures on record. One of the most striking values was recorded at Kew Gardens in Greater London, where temperatures reached 35.1°C, exceeding its previous station record of 29.3°C and the previous UK May record of 32.8°C.”*

So, can we expect a surge in claims this year or do we risk catastrophizing as the above article by Tony Boobier in edition 252 suggests? *“It seems like, at least for the moment, we’ll probably just have to rely on intuition and how much the seaweed has dried out, which seems (at least, to me) to still be a bit ‘hit and miss’. And as a result, won’t the industry inevitably just have to ‘cry wolf’ until a surge event actually happens? By then, won’t it be too late to act in terms of effective claims management and proactive customer service?”*

It looks as though this year provides useful data to review any predictive mechanism – we shall see.

Met Office Anomaly Maps for May 2026

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

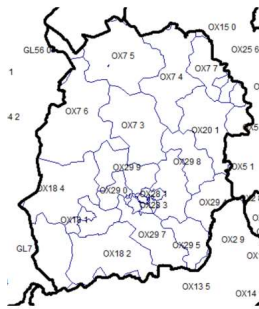


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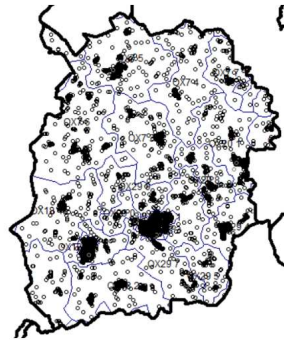
Subsidence Risk Analysis – West Oxfordshire

West Oxfordshire is situated in Oxfordshire and has an area of 714.4km² and a population of around 121,000.

West Oxfordshire



Postcode Sectors



Housing Distribution

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.

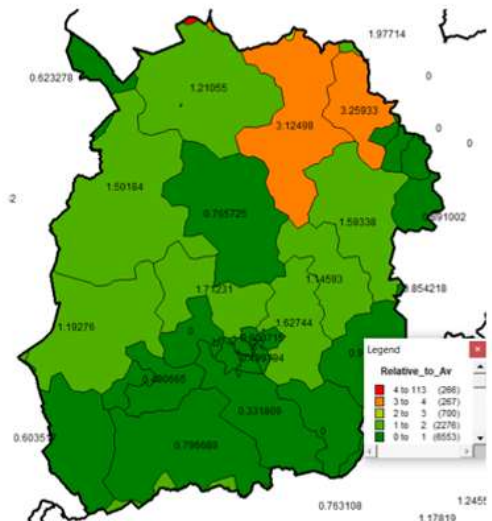
Sector and housing distribution across the district (left, using full postcode as a proxy) helps to clarify the significance of the risk maps on the following pages. Are there simply more claims in a sector because there are more houses?

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.

In terms of risk, West Oxford is rated 196th out of 413 districts in the UK from the sample analysed and is around 0.907x the risk of the UK average, or 0.235 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.

Subsidence Risk Compared to UK Average



Sector risk compared to UK average from the sample analysed.



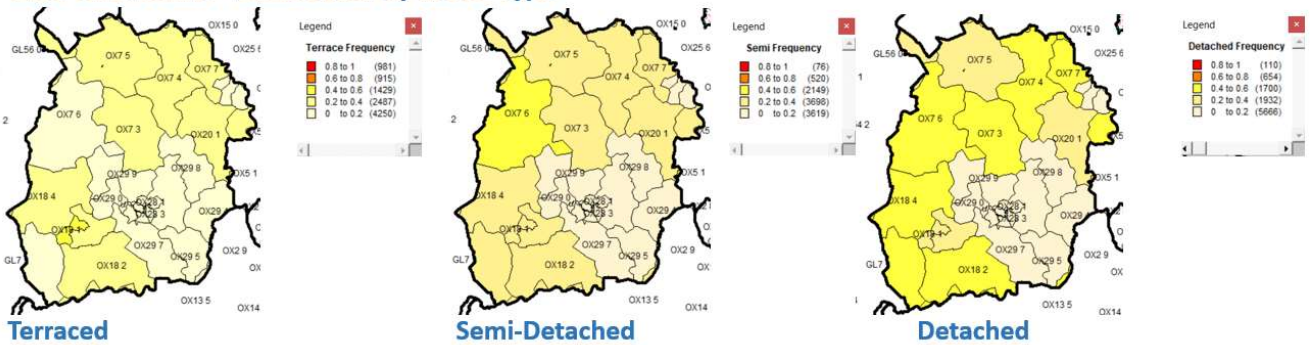
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West Oxfordshire - Properties by Style and Ownership

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

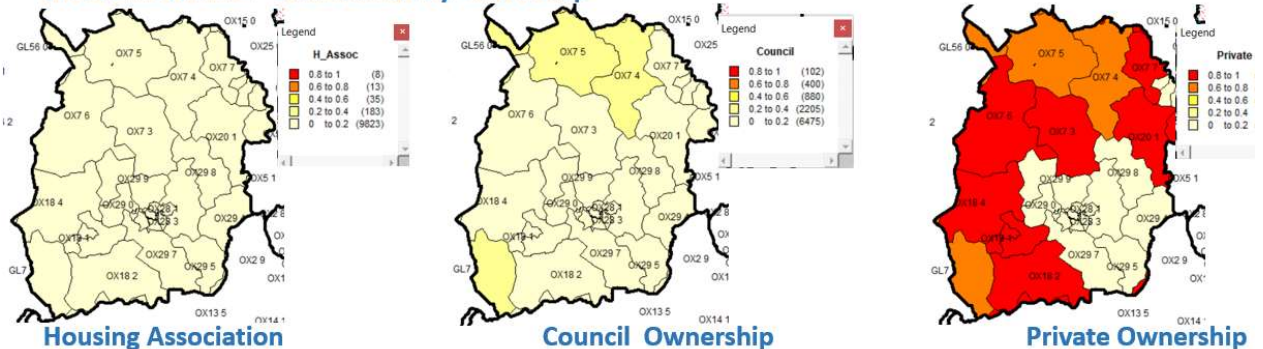
Risk increases with age of property and the model can be further refined if this information is provided by the homeowner at the time of taking out the policy.

West Oxfordshire - Distribution by House Type



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

West Oxfordshire - Distribution by Ownership



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Subsidence Risk Analysis – West Oxfordshire

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

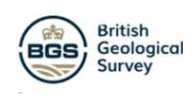
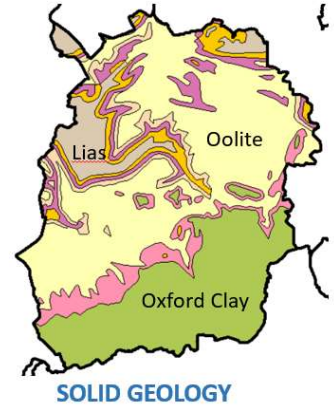
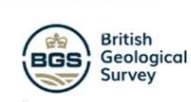
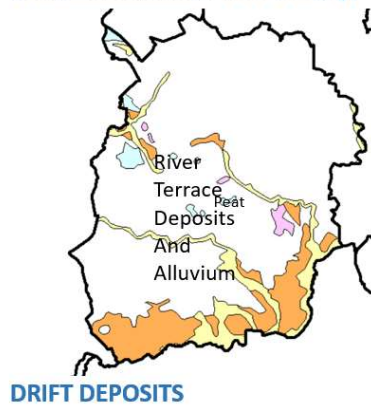
<http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

See page 11 for a seasonal analysis of the sample which reveals that, at district level, from the sample held, there was around a 80% 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 clay shrinkage.

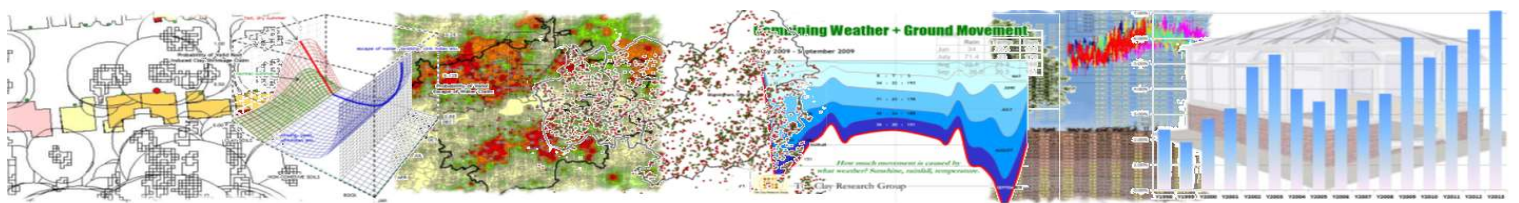
In the winter, the likelihood of a claim being valid falls to less than 20% and of the valid claims, around 90% were attributable to an escape of water.

The geology comprises small areas of drift deposits of River Terrace and Alluvium overlying a solid geology of Lias, Oolite and Oxford clay.

West Oxfordshire : 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.

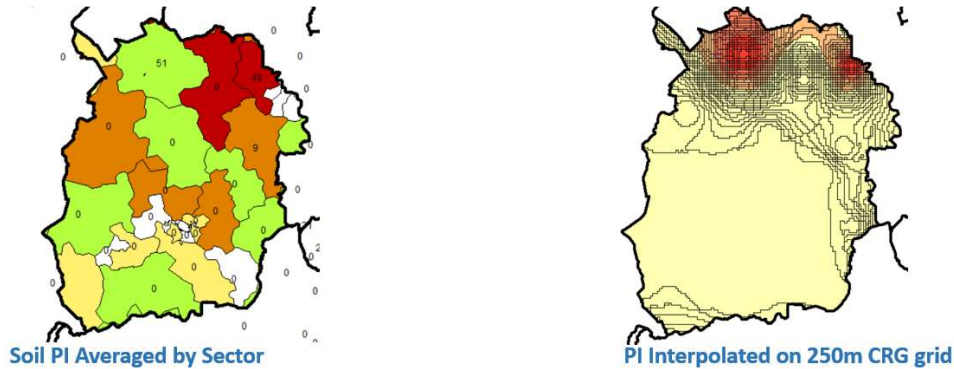


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Liability by Geology and Season

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

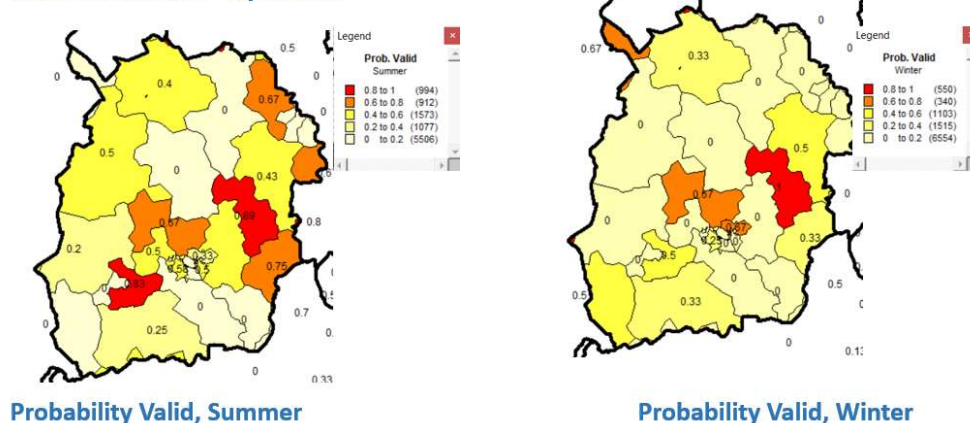
West Oxfordshire – Soil Plasticity Index



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 11 is perhaps the most useful way of assessing the potential liability, likely cause and geology using the values listed.

West Oxfordshire – by season

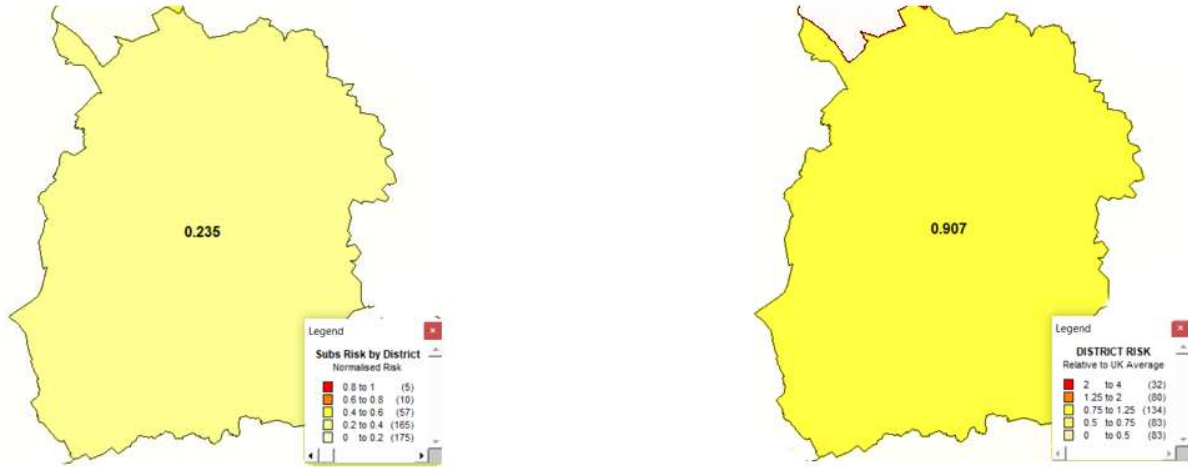


A high frequency risk can be the product of just a few claims in an area with a low housing density of course and claim count should be used to identify such anomalies.



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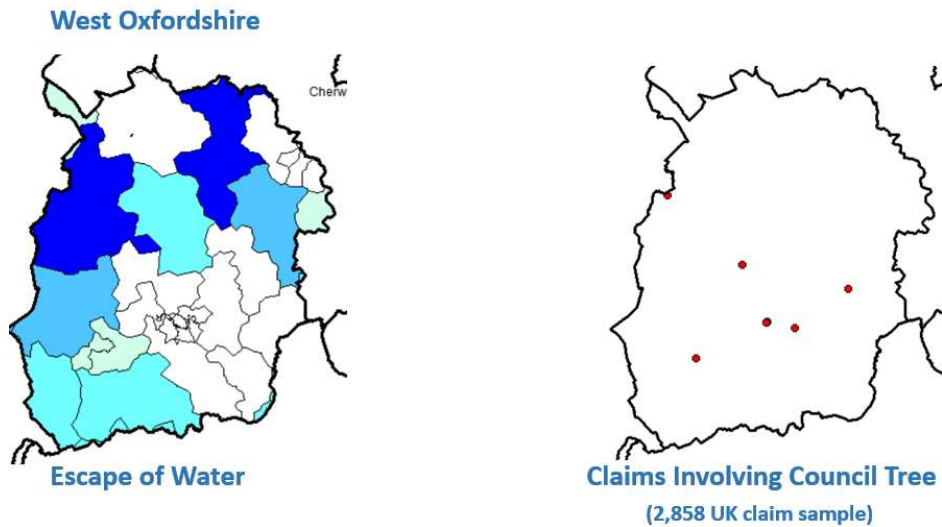
District Risk. EoW and Council Tree Risk.



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. In this case their location identifies the presence of shrinkable clay soils.

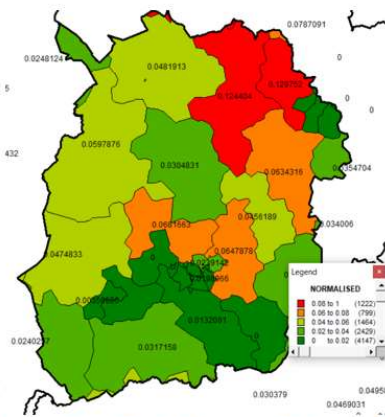


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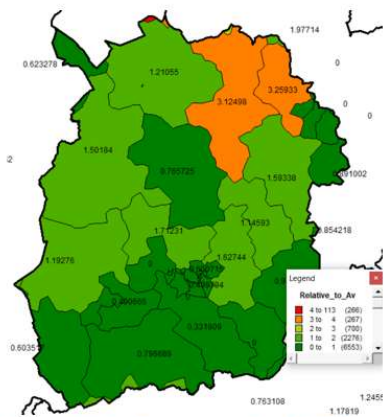
West Oxfordshire - Frequencies & Probabilities

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 – West Oxfordshire



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 - West Oxfordshire

District	valid summer clay	valid summer EoW	Repudiation Rate (summer)	valid winter clay	valid winter EoW	Repudiation Rate (winter)
West Oxfordshire	0.754	0.031	0.215	0.01	0.16	0.83

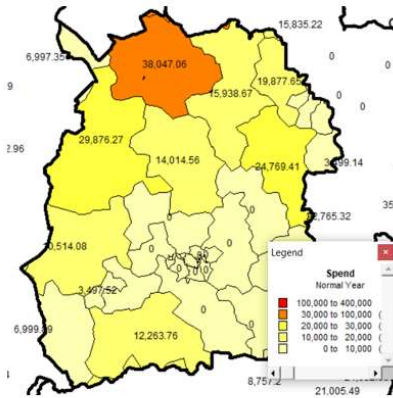


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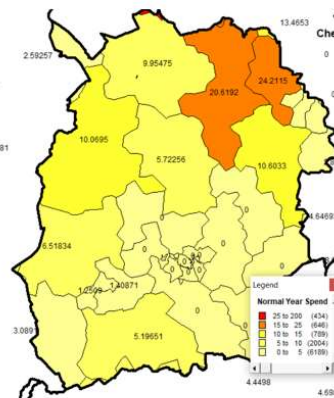
Aggregate Subsidence Claim Spend by Postcode Sector and Household in Normal & Surge Years

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 – West Oxfordshire



Spend by Sector

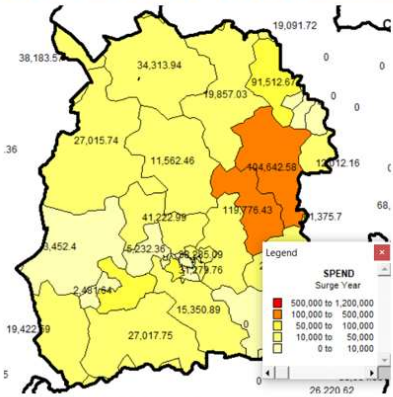


Spend Averaged Over Private Housing Population

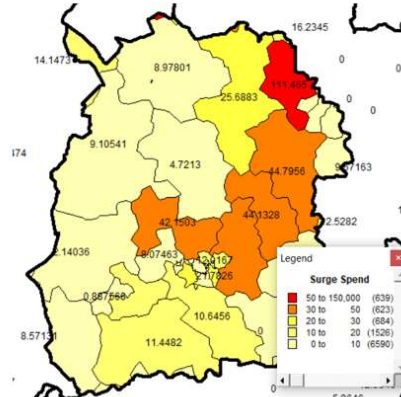
The images to the left in both examples (above and below) represent gross sector spend and those to the right, sector spend averaged across private housing population to derive a notional premium per house for the subsidence peril.

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

SPEND in SURGE – West Oxfordshire



Spend by Sector



Spend Averaged over Private Housing Population

