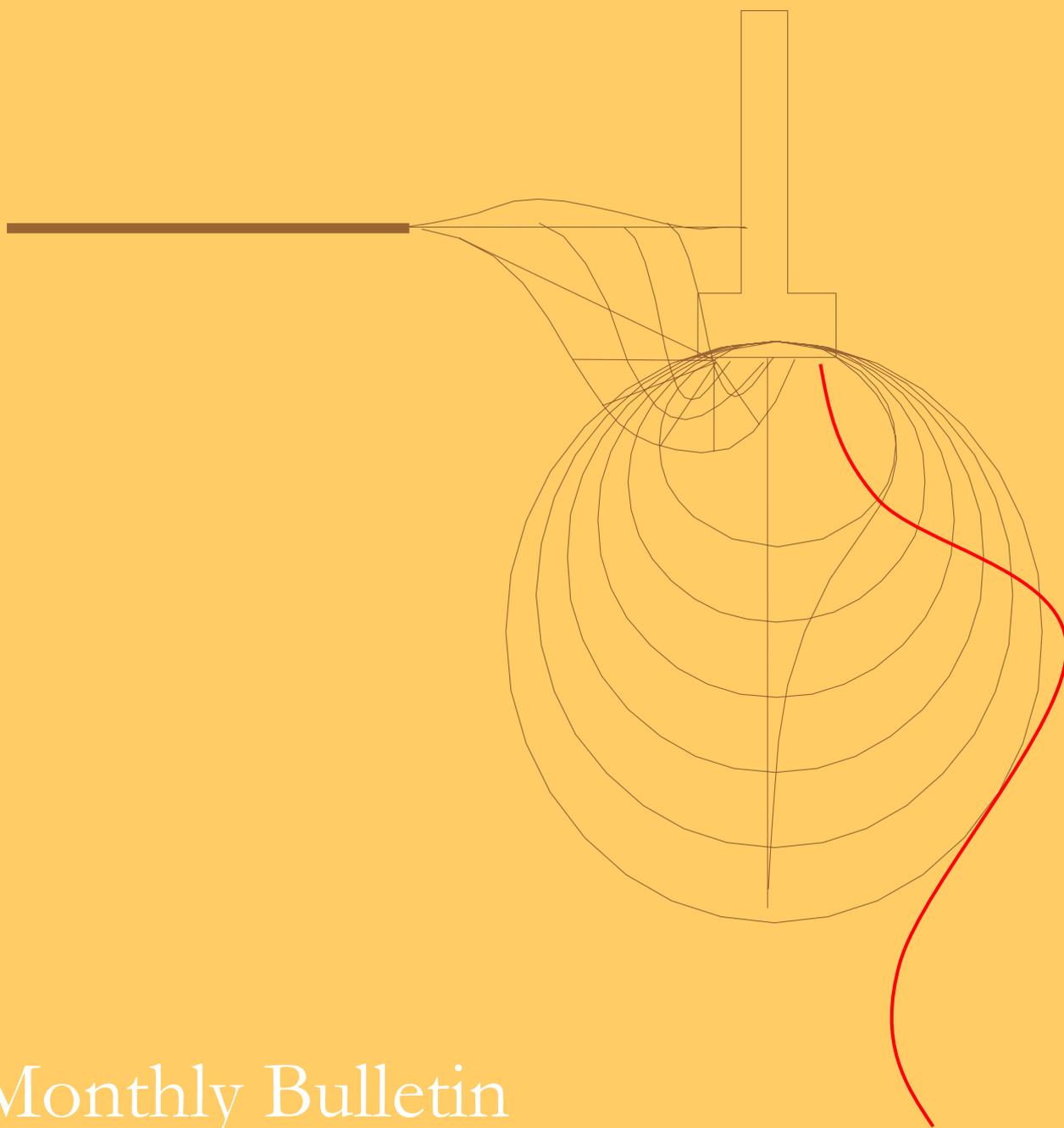


The Clay Research Group



Monthly Bulletin

CONTENTS

Page 1

Looking forward to 2007

Page 2

Probability Data

Page 3

Triage
Sequencing the UK subsidence risk

Page 4

Esure Research Report on
Impervious Paving.

Researching Risk

Esure engaged the British Geological Survey to research the effect that covering front gardens with impervious paving has and the results are to be published shortly.

Educating homeowners about risk will undoubtedly help insurers generally and the CRG were more than happy to collaborate by providing actual claim examples and linking in to our own survey of Harrow where we were counting trees that had been felled over the last 10 years.

This work ties in with the pilot study we are undertaking for the London Assembly where we discovered that, in the study area, 25% of pavement trees had been felled over the last 10 years.

In turn, there is a direct link to the work we are carrying out at Aldenham. The persistent moisture deficit beneath the Oak tree simulates the conditions that exist beneath an impervious driveway.

We know from the levelling exercise that the ground moves less where there is a persistent deficiency, and more at the root periphery. In short, we are driving ground movement closer to the house where the soil does not rehydrate beneath a paved area.

Looking Forward - 2007

The start of a New Year, and just some of the more recent developments ...

An enquiry from the Katholieke Universiteit Leuven in Holland added an international flavour to proceedings.

John Parvin, the Chair of The Subsidence Forum and head of the subsidence unit at Zurich Insurance came along to see what was going on, accompanied by the Zurich climate change graduates. They met the experts from Southampton University (Dr Derek Clark and Dr Joel Smethurst) to discuss what might happen over the next 50 years, and following Southampton's publication of their recent paper in Geotechnique, November 2006.

We have received an enquiry from The London Assembly who are researching the loss of street trees over the last ten years. Our library of aerial photographs from 1996, combined with the 2006 Addressology LiDAR data may help to deliver the answer.

The January edition of Ground Engineering carried a full page outlining the work of The Clay Research Group. They said "greater use of technology and telemetry are undoubtedly the way forward", which is encouraging. The work of The Subsidence Forum and ASUC plus were also featured.

TRIAGE is our current hot topic - see Page 3. We believe we have a model that delivers (a) the probability of a claim being valid, (b) what our confidence in that probability is, (c) the likely operating peril and (d) indicators of perils related to particular sectors. This will be added to our web site for review shortly, and anyone interested can trial for a short period. Use of the site commercially will attract a fee.

Talking of the web site, we already have the ability to interpret readings from remote sensors using the DataReader application and will be adding interpretation of soils results using product moment correlation techniques. This is a first and places a 'virtual geotechnical engineer' onto everyone's desk.

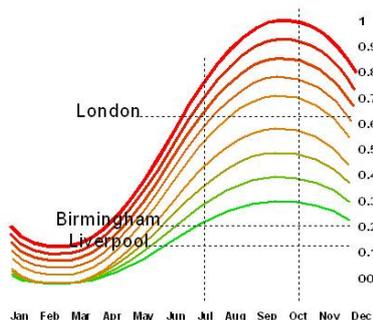
Aston University have invited The Clay Research Group back to present at their June Conference, and Dr Nigel Cassidy (Keele), Paul Stanley (Addressology) and Tim Freeman (GeoServ) have accepted. More news on this when the agenda has been agreed.

Disappointing news from Birmingham University, who lost their PhD student after Christmas, which means our work on electrokinesis may falter slightly. It is also becoming clear that our work on the plant physiology side may be better directed to measuring the result (ground movement) rather than the chemical triggers involved, but we shall see.

Probability

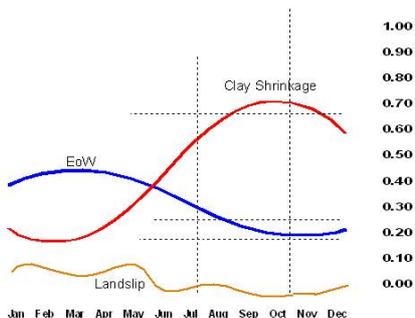
Claims can increase fourfold in a few months in very hot years, but the story isn't the same across the UK as we know, or even city by city.

Seasonal Ground Movement by City



Above we reproduce the relationship between them, each with a value from a normalised scale. The variance in risk changes by sector, by month, by year and by peril.

Peril Probability by Season and Amplitude



Above we see the variation by peril over time, with clay shrinkage being less troublesome early in the year and water claims of varying sorts taking over. Water problems will be less troublesome in highly shrinkable soils, so again, this snapshot of an idealised world changes continually and by location.

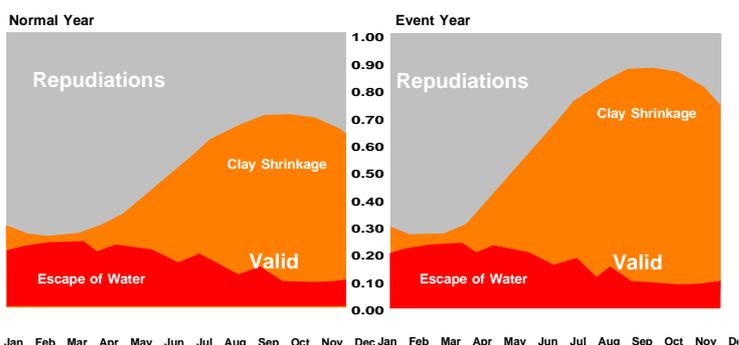
Combining the above data with the previous study on risk by city, and then supplementing this with the claims and geology database all go towards building our Triage application on Page 3.

If you have an interest in modelling risk, contact us.

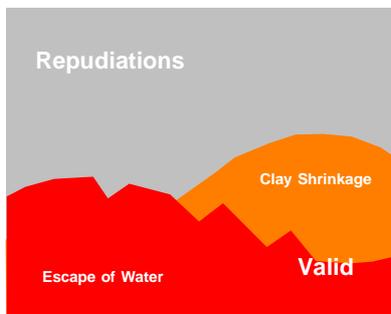
Claim Probabilities

Continuing the probability theme, below we see the diagrammatic distribution of claims between valid and repudiated by season and by peril, with the grey area of the plot representing repudiations.

Peril Probability by Season and Amplitude



It doesn't apply equally to all parts of the country, or even to sectors within a location unfortunately, as we see below. The driver for variance in seasonal amplitude is the geology and sectors with non-shrinkable soils may see little change over time.

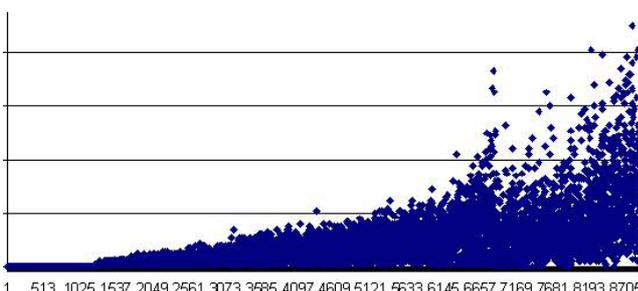


Left we see the pattern for a low shrinkability soil where we may have a higher rate of repudiations, less likely to fluctuate by season.

The clay related claims will be fewer, and usually of less value.

Using the soil index properties to reinforce or reduce the underlying claims data reflects this very well in our experience.

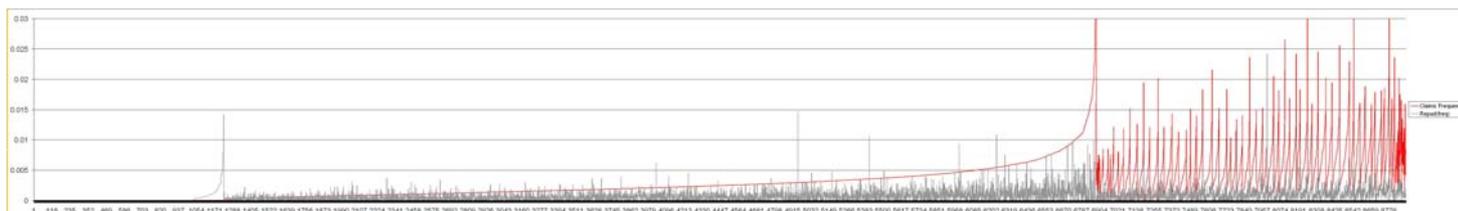
Finally, an understanding of the level of confidence in our assessment might be useful. Many claims in a sector increase our confidence, as do few. Below we have plotted the confidence level by sector.





Sequencing the UK Risk at Postcode Sector Level

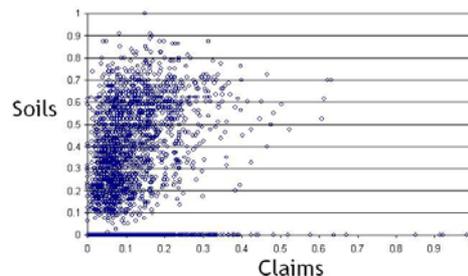
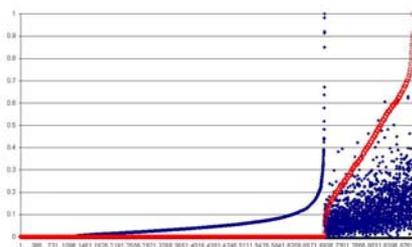
We have sequenced risk for every sector in the UK. The project has been ongoing for several years, and covers over 8,800 units, which are plotted along the 'x' axis. For the first time we can evaluate the frequency of valid claims/repudiations all by category and they can be varied using a climatic factor to allow for change by season/year.



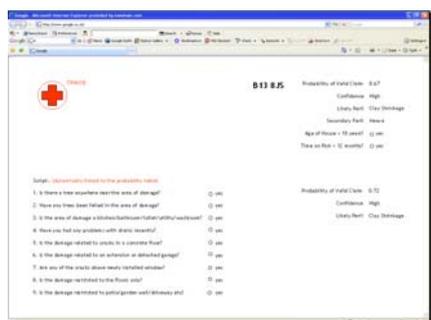
'Clay shrinkage' sectors account for around 20% of the UK, and they contribute 70% or so of valid claims. They can be seen to the right of the plot, the red peaks revealing higher claims frequencies per sector. Repudiations (grey) in this zone are less when expressed as a percentage.

In contrast, to the left and accounting for the balance of around 80% of postcode sectors, the repudiations are more variable, exceeding the valid claims as we move to the extreme left. Towards the centre, repudiations can account for around 20%.

As we know repudiations have a direct relationship to the time of notification and the year in which they are notified. Event years have fewer because of the distortion provided by the valid clay shrinkage claims, to the right.



Intelligent systems have a major benefit over scripted conversations. On entry of the postcode, the operator is immediately given access to the screen we see below. This lists a 'Probability of Valid Claim' value, followed by a 'Confidence in Probability' field. The likely peril is shown, together with a secondary peril. For example, where the most likely peril is 'Escape of Water', and the conversation records 'damage to the floor slabs', 'sulphate attack' is elevated. The year of construction is then a determining factor.



It has simple, easy to use radio control buttons for data capture when on the telephone and takes account of a variety of inputs.

This 'one screen' triage application should help members to resolve resource allocation at busy times, and may even help us change the way we handle certain categories of claims.

One example of this is making greater use of our investigation suppliers earlier on in the claim, supplemented with telemetry.