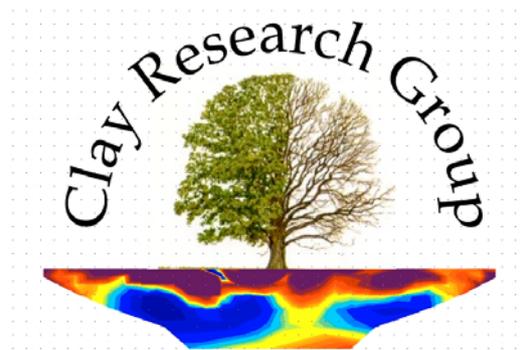


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RESEARCH AREAS

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



December 2011

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CONTENTS

- ⊕ NEWS AND UPDATES
- ⊕ WALTHAM FOREST
- ⊕ RISK BY HOUSE TYPE

CROWN REDUCTION PROJECT

Margaret MacQueen of OCA is diligently progressing with the crown reduction project, seeking to determine if it is an effective and long-term remedy for houses damaged by subsidence.

A meeting was held at City Hall in London last month attended by Jim Smith and Jake Tibbetts representing the Local Authority, and Margaret, Neil Higgs (East Malden Research) and Tim Freeman (director of GeoServ) from the project group with a view to exploring likely sources of funding and scoping the research.

Neil has put forward the following suggestion.

1. Review and summary of currently available data
2. Identification of knowledge gaps
3. New case studies on effects of pruning trees in urban situations
4. Measurement of tree regrowth in urban situations following pruning.

Funding is the first requirement and anyone with an interest should contact Margaret.

WALTHAM FOREST STUDY

Not one of the high risk Boroughs, and all the more interesting from the point of view of seeing the determining factors. What are the differences between Barnet (for example) and Waltham Forest? Why does one deliver more claims than the other?

SEMI-DETACHED

Is the semi-detached inherently riskier than its counterparts, the terrace and detached? The risk graph suggests that to be the case in terms of claims frequency, but is there another explanation? Is it an innocent victim simply in the wrong place, at the wrong time?

House type distribution is considered in this edition, which may throw light on the underlying reason.

RESEARCH UPDATE

The various projects are at different stages with literature reviews and background studies underway.

Clive Bennett is probably further advanced than his colleagues in his work to develop improved methods to test soils and deliver more consistent results, faster.

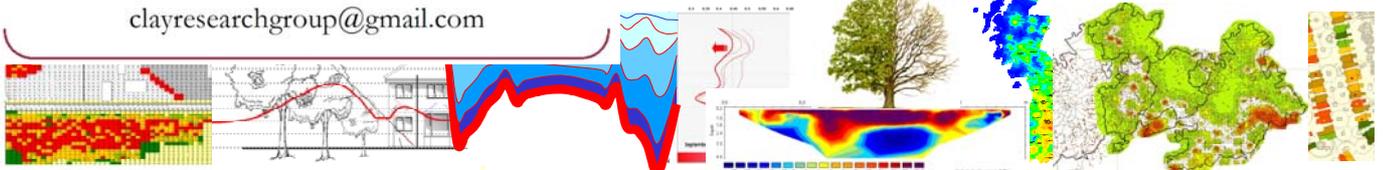
Tom from Birmingham University has been looking at electrokinesis/osmosis (EKO) and we hope to have an update in the next edition. This phase of the research seeks to stabilise shrinkable clay soils quickly and cheaply, with a view to retaining the tree in cases of root induced clay shrinkage.

Allan Tew is working on his second PhD, looking at alternative repair techniques and developing the Intervention Technique. Allan now has considerable experience with this method, and as with the EKO project, the objective is to retain the tree wherever possible, allowing claims to be settled quicker.

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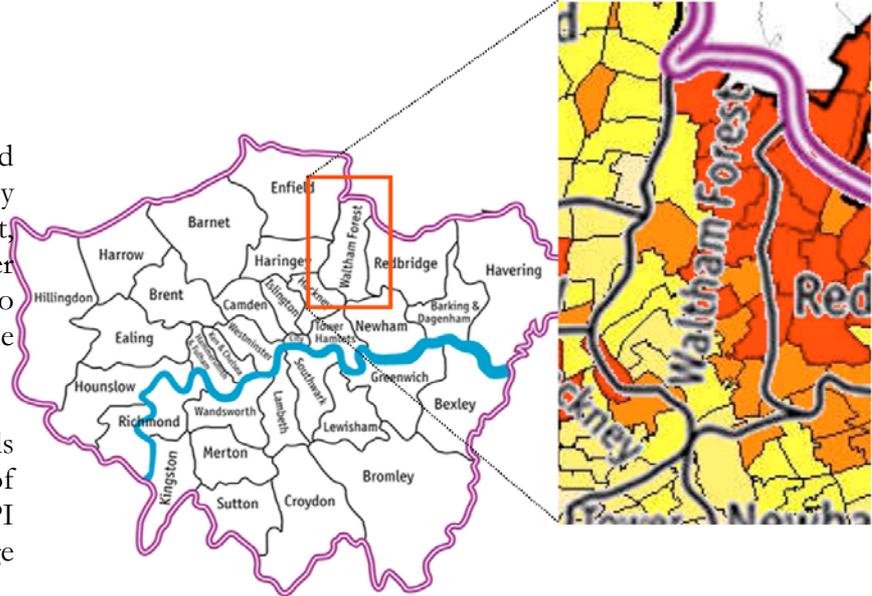


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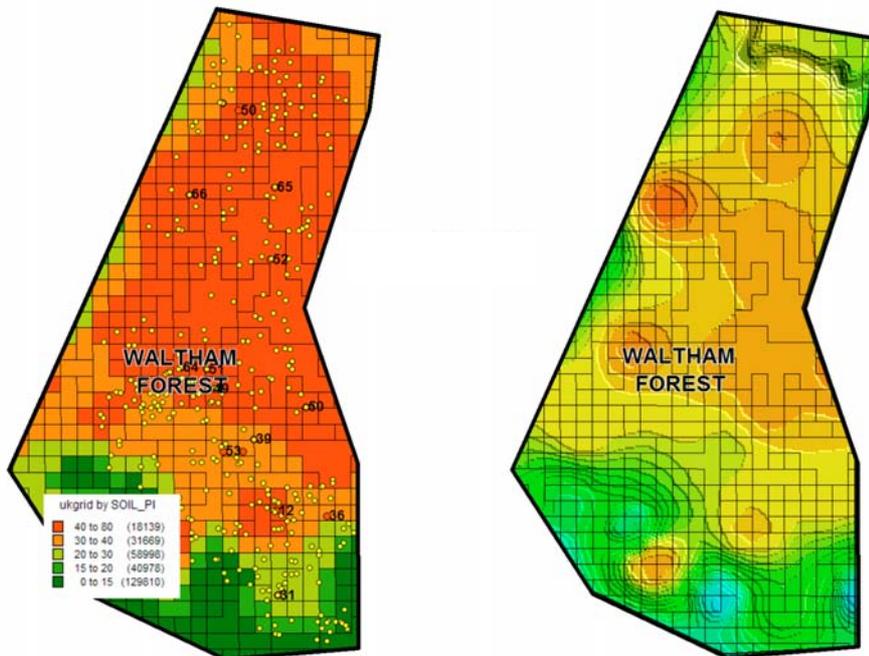
WALTHAM FOREST

Chingford, Walthamstow and Leyton, bordered by Hackney Marshes to the south west, and M25 to the north. Higher subsidence claim frequency to the eastern border and the north of the district.

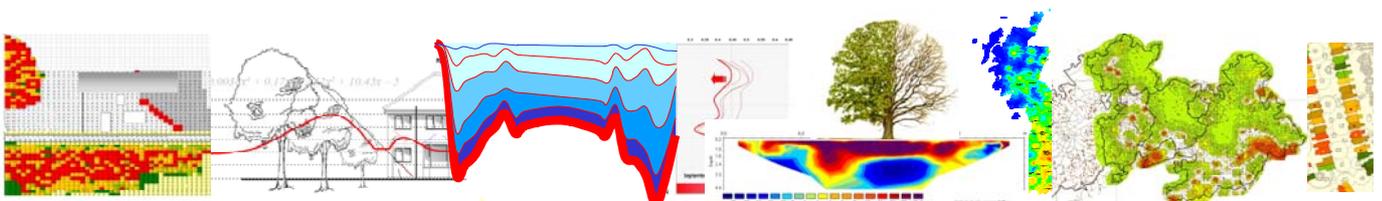
Highly shrinkable soils predominantly to the north of the district. Maximum soil PI recorded, 66% and average (across entire grid) 33%.



GEOLOGY



Same data, different resolution. To the left is the 250m geology grid showing the shrink/swell potential derived from actual investigations across the UK, with values taken from 2mtrs bGL to coincide with maximum root activity for mature trees. Example bores are illustrated as black dots, with the PI alongside. Right, the shrinkable soil distribution at a much higher resolution.

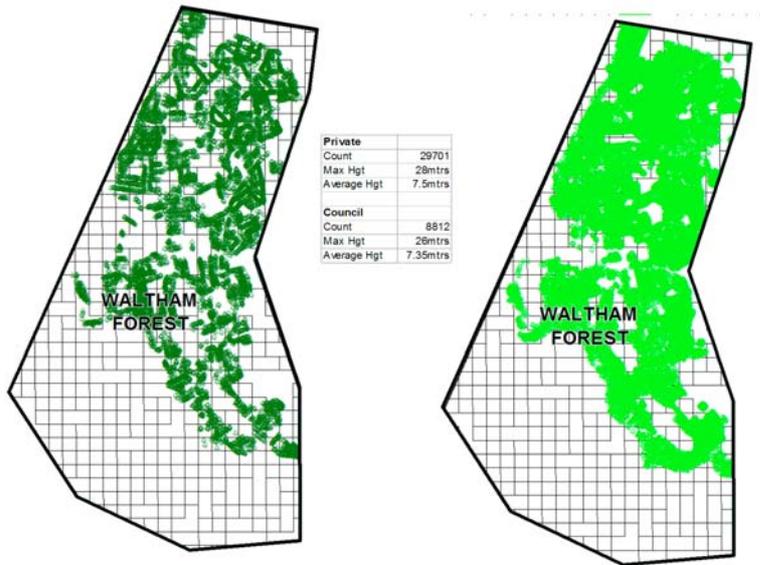


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WALTHAM FOREST - TREES

distribution

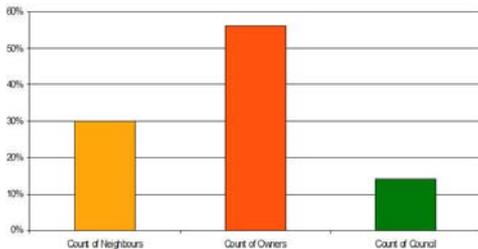


Council trees are plotted left, and private trees, right.

The average height is similar for both at around 6.5mtrs. Maximum tree height is 25mtrs.

London Assembly report in May 2007 recorded that Waltham had 22,000 trees in total and had planted 3,265 over a 5 year term.

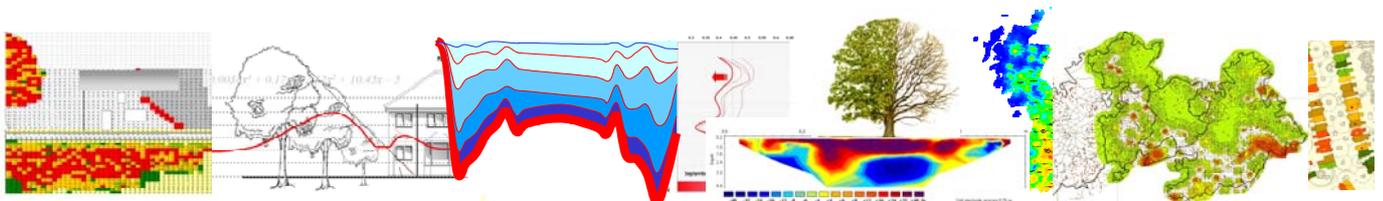
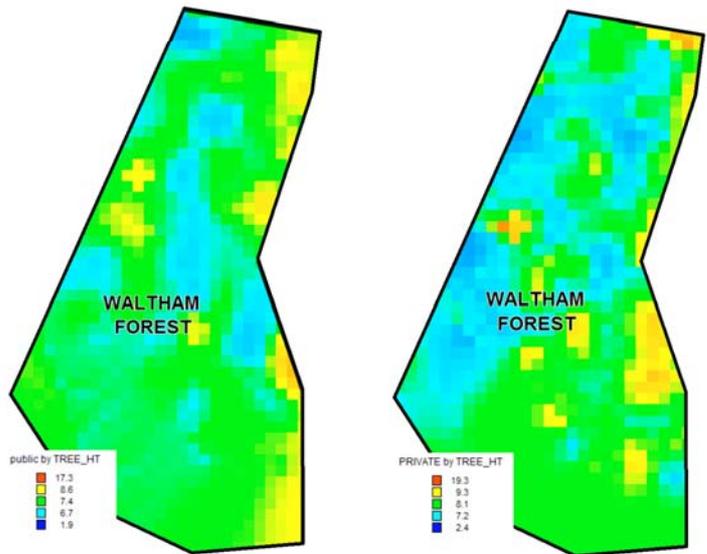
The count of trees within influencing distance of a domestic building and on clay soil at the time of the survey was 8,812 (Council) and 29,700 (private). This goes some way to explaining why private trees are far more likely to be implicated in causing damage than Council trees.



Above, the graph of Council trees for the whole of London involved in cases of subsidence, compared with those in private ownership, split by homeowners and neighbours.

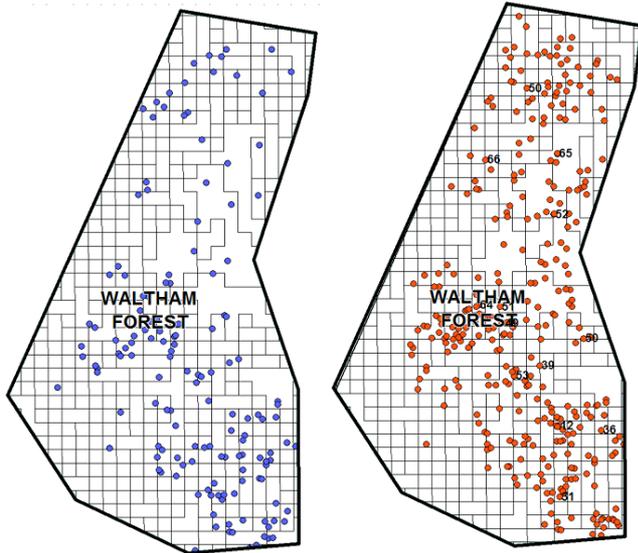
Right, interpolated weighted average distribution of trees by height and ownership.

We estimate there are around 39% of properties in the Borough that are outside the influencing distance of trees and not at risk from root induced clay shrinkage.



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WALTHAM FOREST - CLAIMS



Waltham Forest are one of the less risky Boroughs and left are plotted repudiations (blue) from our claim sample, and valid claims (red).

The variable geology helps to reduce the risk, with less of the Borough covered by clay for example.

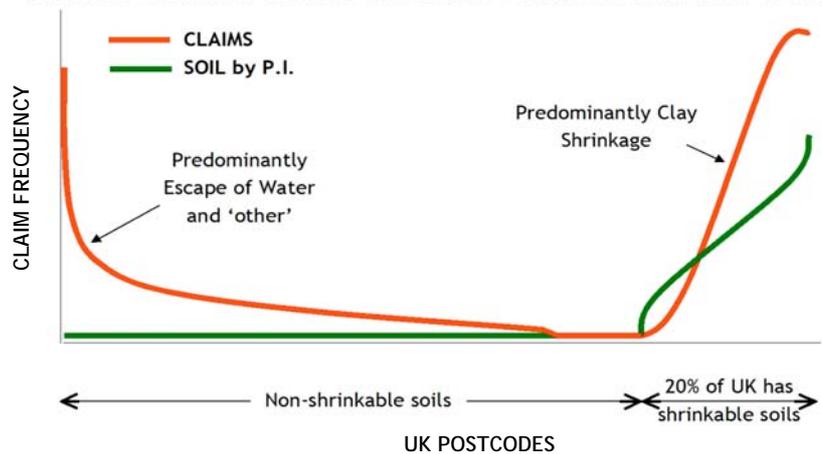
In terms of 'percent root overlap', we estimate that 38% of the properties in Waltham Forest are clear of root activity. This compares with around 22% of houses in Barnet, a higher risk Borough.

This graph appeared in last months edition, and one could be forgiven for asking 'so what?' Is it really just saying that clay related claims exist on clay soils, and 'other claims' on the remainder?

Imagine being asked what the risk is in say B13 8JS, compared with HA5 5SN. We may know intuitively that one is riskier than the other, but by how much, and what are the cost implications? Are there relationships with soil type?

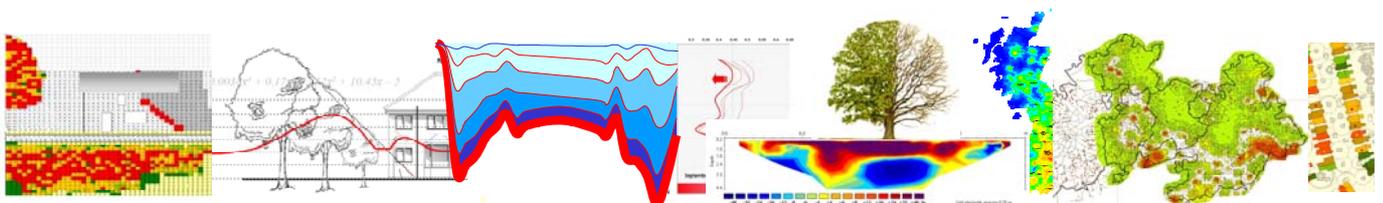
It's all about severity and frequency and it's central to underwriting and Triage.

GENERAL FORM OF THE RELATIONSHIP BETWEEN SOILS AND CLAIMS



The 'x' axis lists all of the UK postcodes, allowing risk to be determined at street level, or aggregated up to town or district.

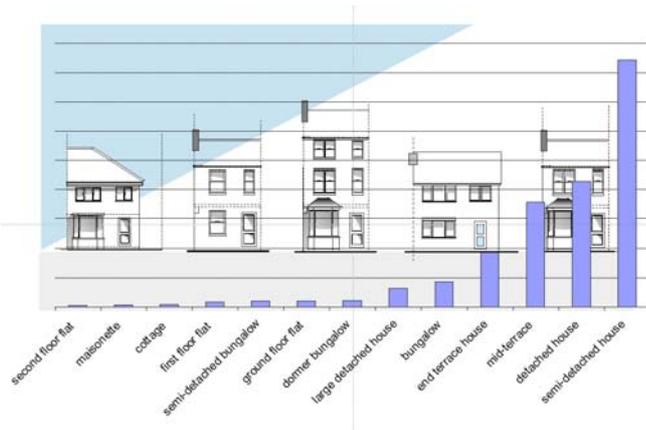
Incidentally, B13 8JS has a risk value of 0.094 compared with HA5 5SN, which is 0.224 and 2.38 times riskier.



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RISK by HOUSE TYPE

Semi-detached houses are riskier than any other type looking at our claims database, and the initial assumption might be that there are simply more of them.

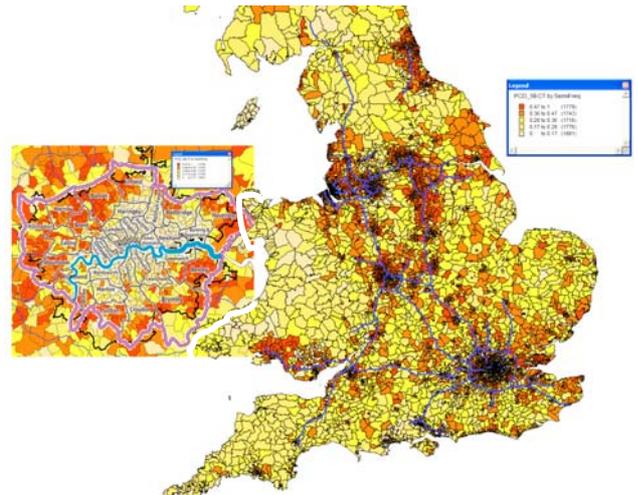


The graph above suggests they are twice as risky as detached and terraced houses. The odd thing is, according to Census data, the number of semi-detached and terraced houses is similar (each accounts for around 37% of the housing population, excluding flats), and detached houses account for the remaining 26%.



Extract of housing count in the above three categories from Census data, ignoring flats and purpose built structures, non-permanent residences etc.

Why is this? Is it the case that the semi-detached house has more drainage connections over a smaller footprint? Are trees more likely to be planted closer to the building than is the case with the other styles of construction? Is the terrace safer due to the support from neighbouring properties?

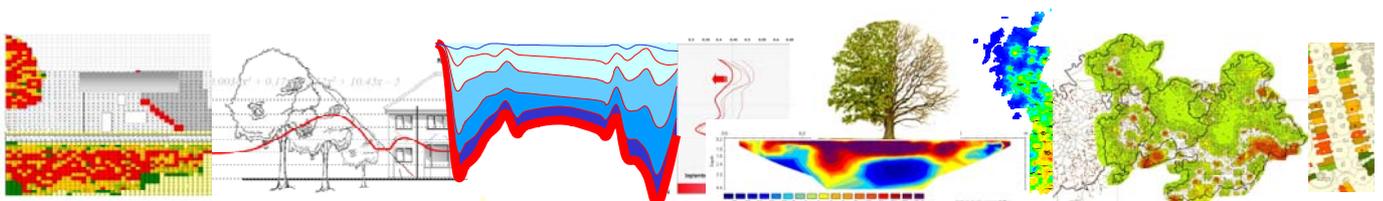


Or is there simply a greater concentration of them in riskier areas? Plotting the distribution of semi-detached houses at sector level suggests this may well be the answer. The semi is well represented in the high risk clay belt in the Boroughs of Brent, Barnet and Harrow as well as the 'escape of water' parts of the country, those with variable drift deposits and sand.

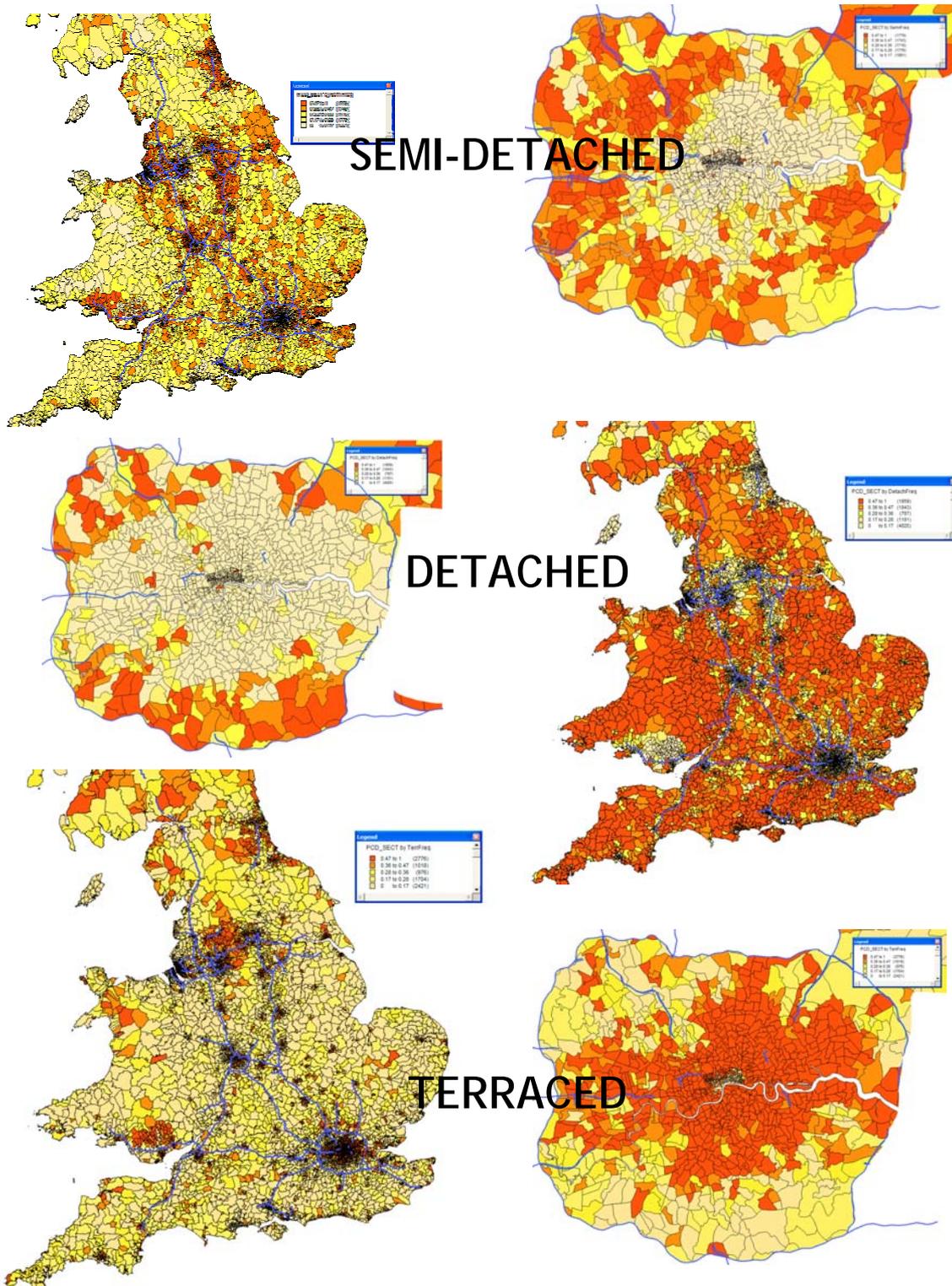


We could see no obvious reason simply comparing the site layout of each category of house type.

Is it important? Probably only if you are an underwriter. Such remarkable differences between styles of property and risk is as powerful an indicator as any other when looking at frequency data.



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House type (terrace, semi-detached and detached) distribution across the UK. The semi-detached may be riskier due to its high frequency locations on outcropping London clay (Barnet, Brent and Harrow) but also where there are high numbers of escape of water claims on non-cohesive soils. Detached houses have a stronger presence in the countryside, and terraces occupy the dense, inner cities. In London they follow the outline of the predominantly alluvial soils.

