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

The Clay Research Group
www.theclayresearchgroup.org

August 2011

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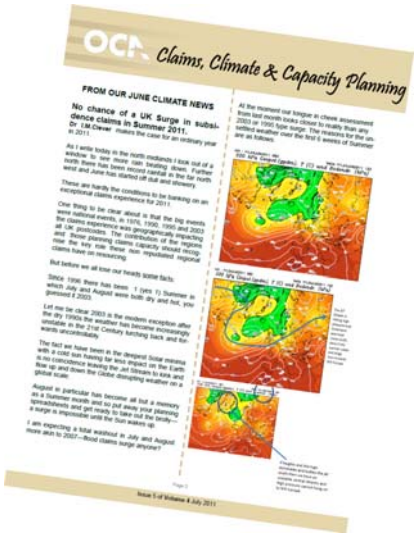
CONTENTS

Climate Update

Michael Lawson from OCA has reviewed current weather patterns and their effect on climate – and possibly claims – for 2011.


OCA Claims, Climate & Capacity Planning

FROM OUR JUNE CLIMATE NEWS

No chance of a UK Surge in subsidence claims in Summer 2011.

The paper matches developing SMD profiles with those from previous years and the prediction for 2011 stands at Amber. For details contact Michael on michael.lawson@landscapeplanning.co.uk or visit his blog at http://www.landscapeplanninggroup.co.uk/our-blogs/insurance/

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LONDON STRATEGY for TREES

Does it seem odd that the strategy for trees in London is to plant more to increase canopy cover on one hand, whilst crown reducing so many of their existing stock on the other?

The average spend of each Borough on tree maintenance is around £300k p.a. apparently. Not all spent on crown reduction of course, but it can't be cheap.

The Mayor of London wants to see more trees planted to combat the effect of the "Urban Heat Island". The Greater London Authority, in their report '**Branching Out'** dated April 2011 say "*The Mayor has a strategic objective to increase canopy cover from between 20 per cent to 25 per cent… This represents around an additional two million trees, and street trees will play a part in reaching this goal."*

The current estimated number of street trees is around 500,000 out of a total tree population of 6m.

Although the London Assembly recorded that only 5% of trees felled had been lost due to subsidence claims in their 2007 review, Branching Out says *"Our report highlighted that street trees were at particular risk from felling due to subsidence-related insurance claims."* It goes on to report … *"Taking account of felled street trees, the data indicate there has been a net gain of 6,792 trees across the boroughs in 2009-10."*

When the new trees grow, will we start all over again, reducing their crowns? Does crown reduction work? Do Boroughs that carry this out receive fewer claims as a result?

An appropriate response to cases where trees have been proven to be the cause of damage might be to cut them down, as suggested by Dr. Giles Biddle many years ago. Routine crown reduction and tree mutilation across the city seems to be part of the problem, and not the solution?

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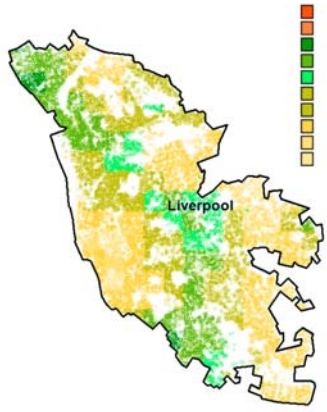
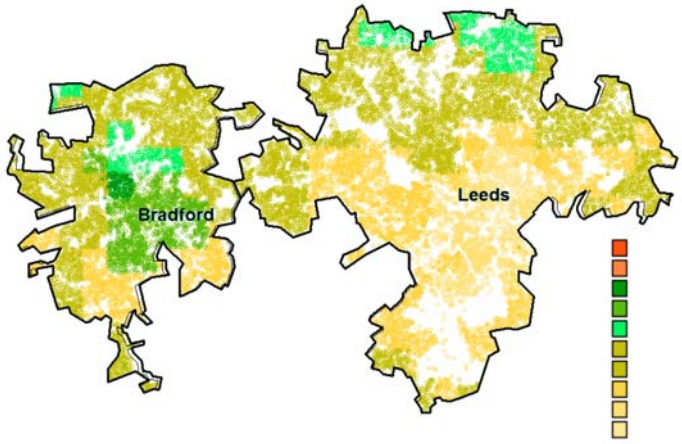
DISTRIBUTION of RISK ACROSS THE UK by CITY



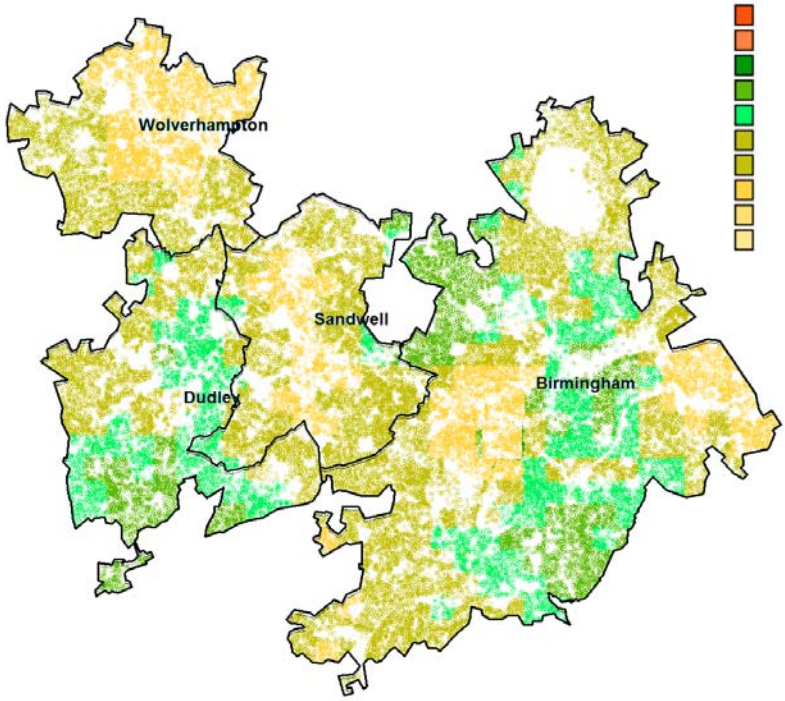
LIVERPOOL



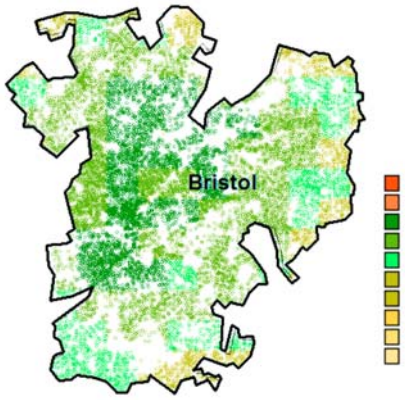
BRADFORD & LEEDS

The cities are not drawn to a consistent scale, but the key is constant throughout, with red being high risk, yellow low risk and green intermediate. See legend.

The maps provide some insight into how the risk is distributed within the city, and the relative risk between cities, all expressed as frequency.



WEST MIDLANDS



BRISTOL

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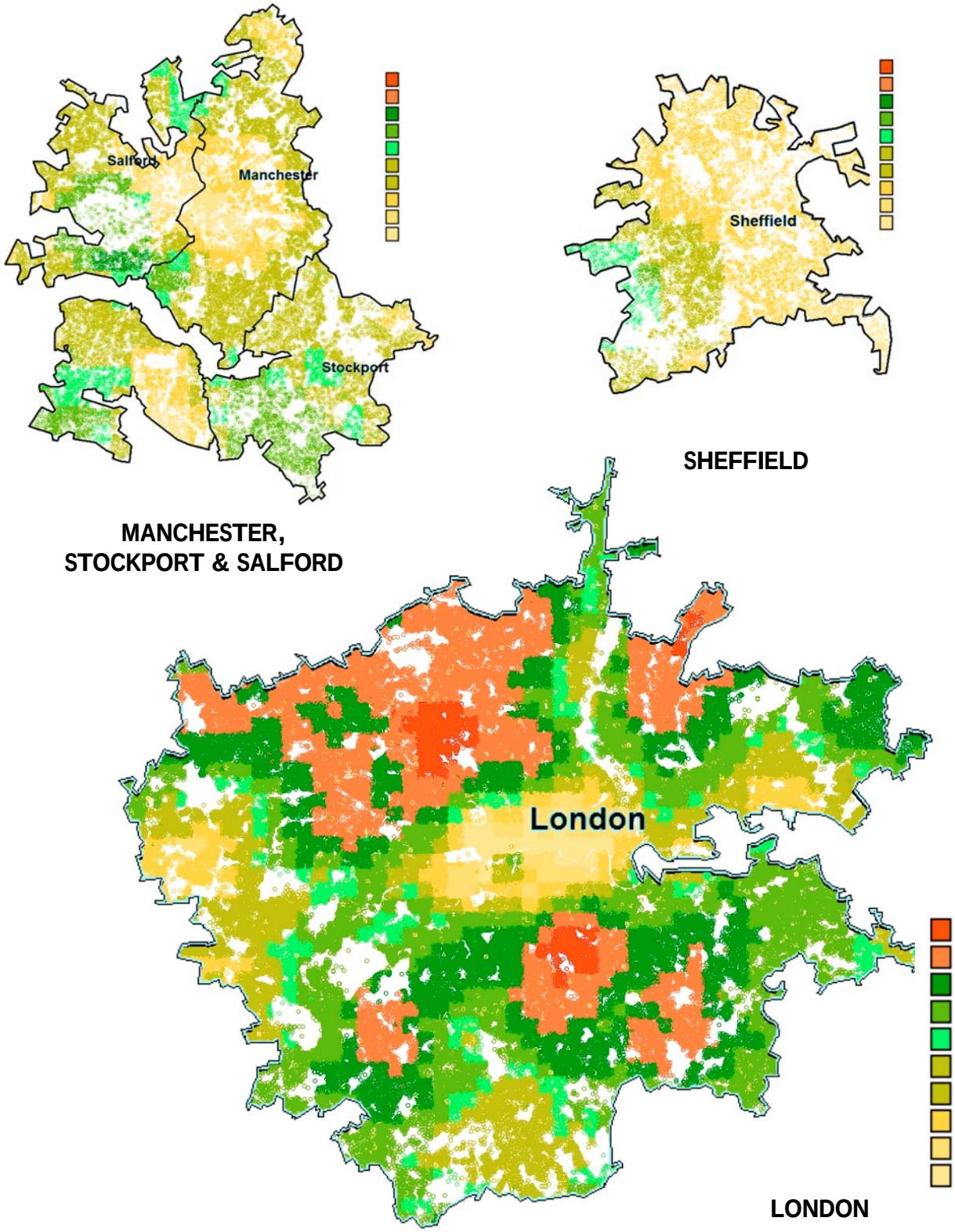

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SUBSIDENCE FORUM AGM

The Subsidence Forum held their AGM at the BRE in Garston, Watford on the 19th July. It was a well attended event and saw see Neil Curling elected as Chairman for a two year term.

Reports from the Task Groups confirmed that much had been achieved in Geoff Davies term of office. Geoff expressed concern at the lack of resource in the industry and wondered how we would cope in a surge.

He also touched briefly on the poor standard of engineering that he sometimes encounters when reviewing industry files. A topic close to many auditors hearts and particularly relevant in the context of discussions with Local Authority tree officers when seeking tree removal.

This led into Jill McLean's request for help with the training day. Basic technical standards have to be improved and the training days are invaluable - provided (as Peter Osborne pointed out) that staff as well as managers are encouraged to attend.

Peter Osborne outlined the benefit of liaison with the tree officers from Local Authorities and reinforced the benefit gained from training days.

Nigel Bareham spoke about the importance of customer relations and Iain McLean described the work of the procurement task group.

To conclude the day, the CRG gave a presentation outlining how they built their Climate Model, and Roger Bulkley explained the changes that are taking place regarding the adoption of sewers by Water Authorities and the implications for insurers and homeowners. When things go wrong – when drains are blocked - who do we phone?

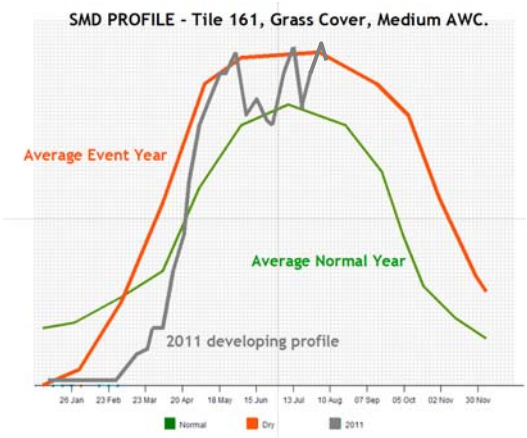
TREE ROOT CLAIMS LIAISON GROUP WORKSHOP

~ 3 August 2011 ~

Andrea Plucknett, the insurance officer from Welwyn & Hatfield Council hosted the meeting, which touched on (a) priorities and barriers, (b) skills and knowledge sharing, (c) mitigation & recovery protocols before discussing peer review.

CURRENT SMD

The profile is irregular, and the initial threat of an exceptionally dry summer has reduced due to recent rainfall but the potential for an increase in claims remains as the SMD profile touches the event year line periodically.



OCA are following the deeper SMD values for tree cover (see front page) which remain high.

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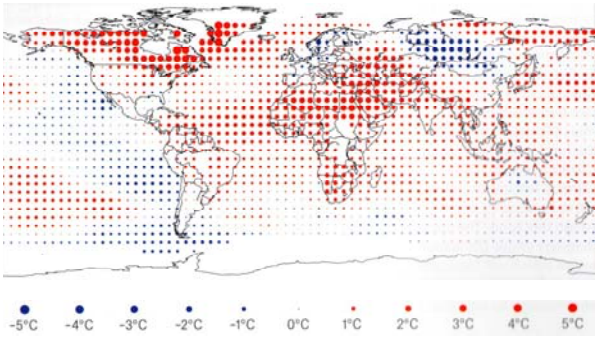
CLIMATE MODELLING
~ Building Research Establishment 19th July, 2011 ~

We were invited to speak at the Subsidence Forum AGM on the topic of Climate Change and reviewed the complexity of delivering a model that would be relevant to the UK subsidence industry.

The reason why the term 'Global Warming' changed to 'Climate Change' is illustrated below in an extract from the Munich Re publication, Topics Geo, based on data from the National Climate Data Centre for 2010.

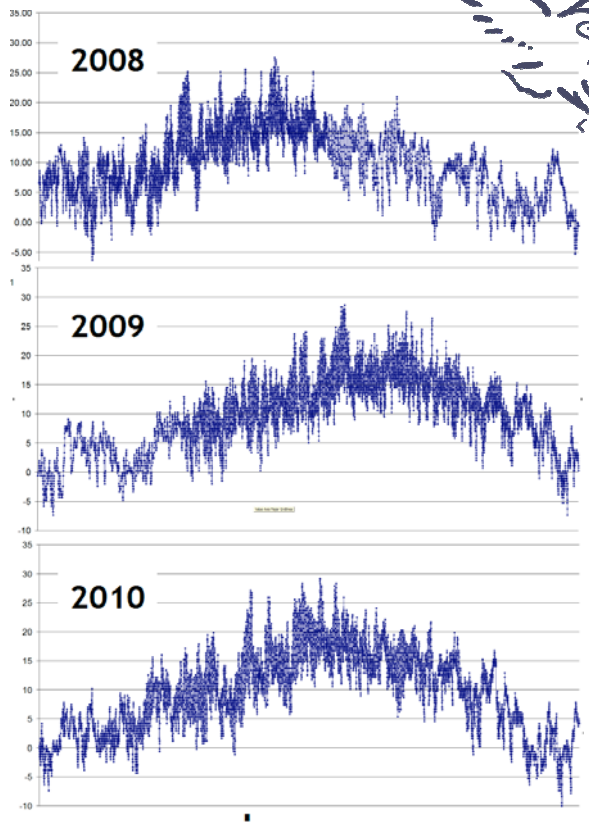


A global average doesn't reflect the variations taking place across the world. In 2010, Canada and Africa were warming whilst parts of Russia, Scandinavia and the Pacific were cooling.

Applying a global average to the UK London clay belt is meaningless for our purposes.

The complexity is further reinforced when we look at temperature data from the weather station at Aldenham (see right). The data peak at differing times and averages don't account for duration and extremes.

How do we relate 5mm of rainfall with temperature changes measured in degrees for example, and what about the duration?



Temperature data from Aldenham peak at different times, and are of varying duration. Averages only give a very broad view.

To take account of the combined elements we are working on the tension model outlined in edition 70.

The advantage of this approach is that it is agnostic of degrees or mm of rainfall. It works from extremes and is self-regulating, automatically taking account of change.

That said, any weather model is little better than looking out of the window. The main thrust of our model is allowing 'what if' modelling for insurers and for re-insurers to look 50 years into the future.

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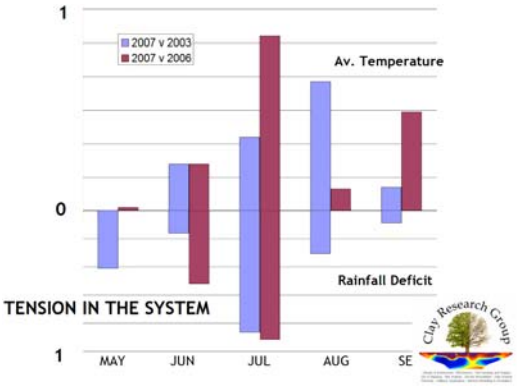
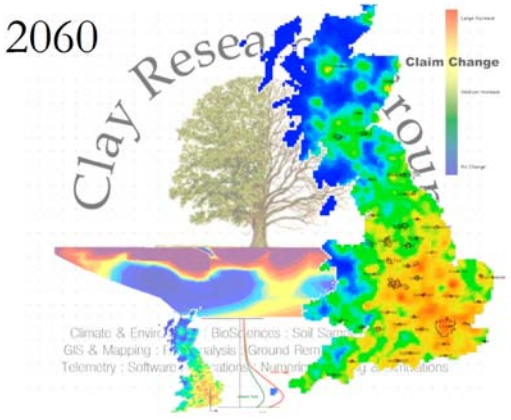


The CRG tension model allows temperature and rainfall to be resolved on a normalised scale, as shown above.

If the temperature in the UK rises by 3, 4 or 5°C what are the implications for insurers and adjusters? How many claims in which sectors, of what value?

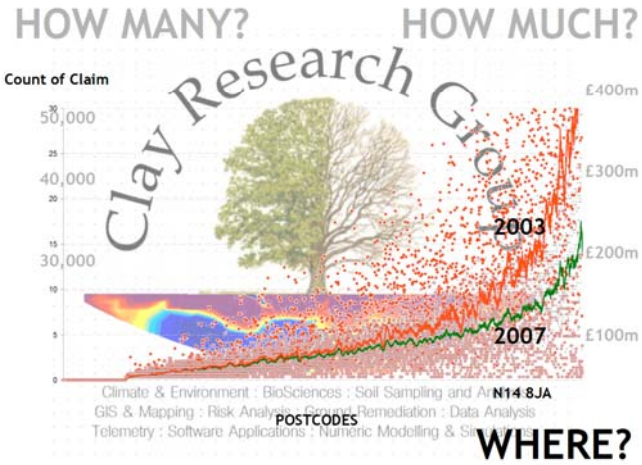
These values are linked to the claim distribution model that informs us of numbers and losses by location, all linked to the geology.



Map illustrating the spatial distribution of claims for the year 2060 based on the climate predictions made by Southampton University.

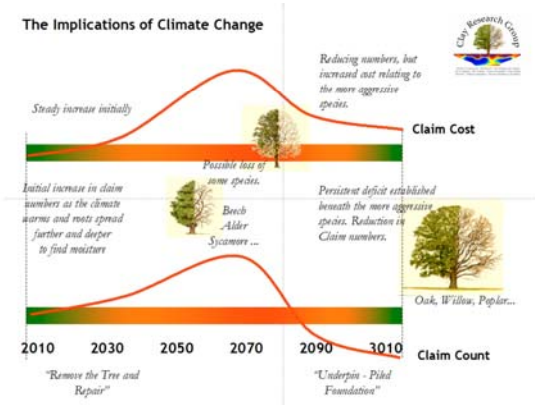
Below we reproduce the slide asking 'How Many?', 'How Much?" and "Where?"

The 'x' scale plots the location, and the 'y' scale the numbers either by claim count or industry loss, using 2003, 2006 and 2007 to provide scale.



The green line represents a normal year (2007) and the red a 2003 type event. Divergence is related to soil type, with small differences on the drift deposits, increasing through the Mercia Mudstone and widening through the London clay series etc.

Bringing all of this together delivers the model below, with claim costs predicted to increase along with the rise in temperature as more houses are damaged as roots extend further in search of water. The cost of repairs also increases as felling of trees becomes less acceptable leaving piled rafts as the only alternative.



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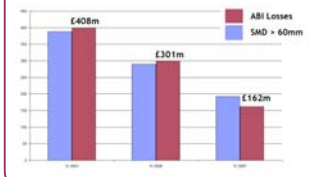
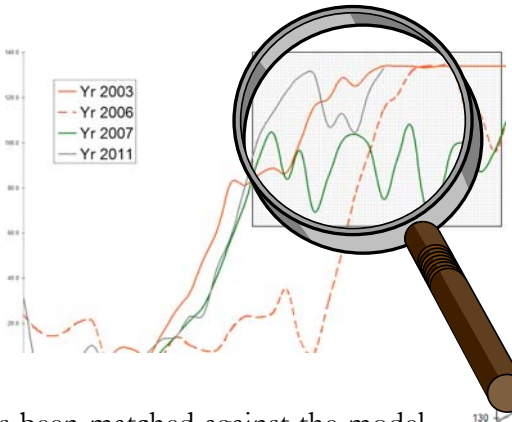
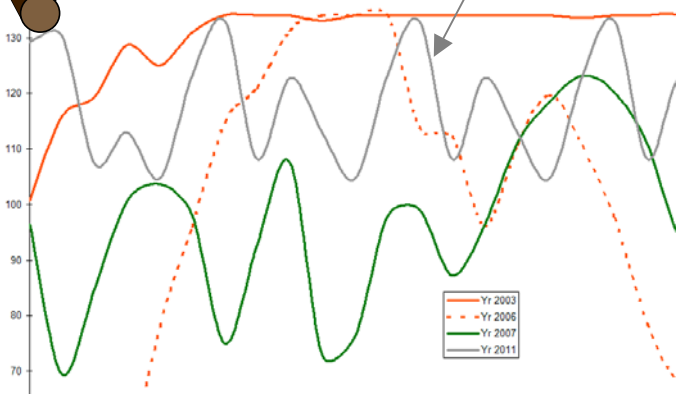
2011 UPDATE



Losses based on ABI claims data, matched with average SMD values exceeding 60mm deficit for the sample period, multiplied by 6 to normalise the scales.

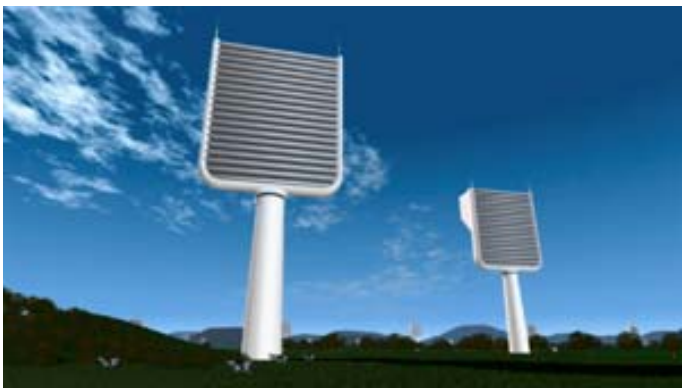


2011 wave pattern (following 2007 but with a greater amplitude) projected forward.



2011 has been matched against the model years of 2003 (event), 2006 (intermediate) and 2007 ('normal'). The correlation between the SMD analysis and losses recorded by the ABI is robust, as we see above, right.

The profile is following 2007, although with higher values, and the trends seems to suggest we will see higher claim numbers, not as high as 2003, but possibly closer to 2006?



SYNTHETIC TREES

Scientists from Colombia University have developed a synthetic tree to capture carbon from the atmosphere.

They have formed Global Research Technologies and the 'trees' absorb CO^2 a thousand times faster than real trees, although sequestration remains an issue. What do they do with it once they have captured it?

Wind farms generating electricity, plastic trees cleaning the atmosphere. It makes you feel warm inside. The trees use proprietary resins to trap the CO^2, and have a projected lifespan of around 15 years.