

Ambiental
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Mapping technology - The great drain robbery.

The inadequate drainage systems available to deal with freak flood incidents were a major factor in increasing the scale of the recent flood crisis in the UK, reports Olivier C Laurent. Likened to the rail industry's infamous 'wrong type of leaves' defence, insurers have conceded that their modelling was unable to predict this new type of flood threat but there are signs of surface run-off risk being addressed.

On 1 September 2002, the Association of British Insurers released its updated statement of principles ensuring flood cover for properties at risk. The move followed guarantees from the government that it would invest more in better flood defences.

Five years later the same debate is taking place between the insurance industry and the government. And the situation is now even more dire. The country is still dealing with the aftermath of the June and July floods, and insurers have had to acknowledge that a new type of flood threat is hanging over policyholders - those floods caused by overflowing drains. Can flood maps chart these freak floods? And what can the insurers and the government do this time?

Peter Adlington, commercial property manager at Allianz Insurance, likens the problem to the railway industry. "In this sector, you have the wrong type of snow or the wrong type of leaves, which can prevent a train from running. This summer we had the wrong type of floods. We are facing new scenarios. It's not only the rivers that overflow now; it's also the small streams and the drains."

Flood model failure

Last month, Norwich Union and Royal and Sun Alliance said their in-house flood models failed to predict a combined £120m in claims caused by the drain-related flooding that hit Hull and the surrounding area this summer. According to Alan Gairns, RSA's property development manager, more than half of RSA's total of £55m claims from the June floods was drainage-related rather than river overflow (Post, 20 September 2007, p3).

Mr Gairns said at the time: "The only gap in our own flood map surrounds the drainage issue." Mr Adlington agrees and says: "I would applaud any work done to map these new scenarios."

Groupama, which usually buys mapping models from several companies and then adds its own data, also believes there is a problem with the data currently available. Craig Allen, household underwriting manager at Groupama, explains: "The main problem most of the models have is that they can't deal with anything other than floods from rivers and seas. They can't deal with floods caused by drains, or any other type of flood."

In the industry, at least on the insurers' side, scepticism is still rampant about improvement to models. Mr Allen says: "So far, I haven't seen any mapping technology company providing data on drains. You can fly over an area and take as many pictures as you want, but you still won't see the drains." And, he continues, even knowing where the drains are is not enough. "It is important to know what state the drains are in. Some are good, but a lot did not work in June and July. The best we can do is look at the elevation and see where the water is going. We can get a fairly good idea of what areas will be flooded."

Andy Brooks, head of insurance underwriting at Endurance, agrees: "It's very difficult to assess the problems caused by drainage. Some do make an attempt to model urban flooding and run-off. But it can be difficult, especially since the model cannot predict the lack of a sandbag in a strategic position."

However, some believe mapping technology companies should not bear the blame on their own. Mr Allen believes that the government should be more active in making sure that flood maps are accurate and encompass all the data available. He says: "The Environment Agency should share more data. We need a better understanding of the flood defences. How good are they? And how well maintained are they? You also have to take into consideration that two or three things can happen at once, creating a knock-on effect we can't always understand. That is what happened in Hull. That's a real worry in terms of exposure."

Modern thinking

Mr Adlington agrees that the EA needs to revise its thinking. "We need to forget about the traditional floods the EA thought about when it built its flood defences." But he adds a note of caution that the government and the EA might not be able to help improve the quality of flood mapping. "Baroness Young (the EA chief executive) said that new homes should not be built on floodplains, but that's it."

Neena Saith, catastrophe response analyst for mapping specialist RMS, adds that the problem with the EA is that it produces flood maps that only look at rivers, rather than the other types of floods.

Mr Brooks agrees: "The design of flood defences and drains is not comprehensive, and they are quite old. It is so obscure for us, so the models can only make assumptions."

However, Mr Adlington adds a word of caution when looking at the age of drains: "In Hull, the drainage system was one of the most modern in the country, and it was still unable to cope with the heavy rains."

Nonetheless, work to map and predict these new flood scenarios has already started. In August, NU said it was working to update its flood maps for the first time in two years. The insurer said although existing flood maps had held up well across most parts of the UK, the situation in Hull, where flooding has been caused by backed up drains, had to be addressed. Simon Warsop, head of flood mapping at Norwich Union, says: "What we have modelled in the past was to do with river flooding and coastal flooding. High risk losses still lie with coastal flooding. In terms of river flooding, the July events have proven that NU's map performed well."

He continues: "As for drain flooding, we had never attempted to model it. We looked at it 18 months ago, but at that time the models were unproven. Since then, a number of people have come forward to show us their models and this time they are cheaper and proven. The cost and benefit is better."

Mapping technology companies are also working on updating their flood maps and Air International will enter the UK market for the first time next year. Milan Simic, managing director of Air Worldwide, told Post that the model will look at the off-floodplain and drainage issue from a probabilistic regional level rather than down to individual drains or buildings (20 September 2007, p3).

RMS is also completely overhauling its existing UK flood model. The company has said the new model will incorporate advanced computer technology and will use a more detailed data set allowing it to analyse risks down to a 10 metre radius. Ms Saith says the new version of its UK flood mapping system will look at areas off the flood plains, "areas that are prone to run-off. It will give a good idea of which areas are at risk". The new model will also be able to simulate all types of rainfall events in the UK.

RMS is present in most major markets and Mr Brooks highlights its accuracy in Germany. Mr Adlington agrees, adding that Allianz will use RMS' new model, the sixth one since its UK launch in 2001, to "build on what they have done in Germany".

In addition, Mr Allen believes: "RMS has a better understanding of knock-on events happening all at the same time, like those that happened in the summer."

However, Mr Brooks says that, while models will get better, "there will always be flood losses in the UK". But he does concede that models can be made more accurate. "For example, increasing the resolution to five metres instead of 50 metres."

Mr Warsop agrees: "It's hard to quantify how accurate a flood map can get. The July floods showed that our river flooding map was accurate. However, a shopping trolley dropped in the wrong part of a drainage system can make a huge difference and render a map obsolete."

Undoubtedly the recent floods, which have renewed the call for more accurate flood maps, will attract more businesses to enter this market. Mr Warsop says: "The recent

events will prompt more companies to come forward and will help bring the prices down."

However, Mr Adlington remains cautious: "Other companies could come in and build a map with a scenario for modelling. But these maps need to be frequently updated. Not all companies getting in that market are able to do this. The proliferation of different maps is not useful."

Technological leap

So, with new maps on the market, should insurers also continue to develop and use their own technology? When NU first developed its flood map, it invested £5m. "This gave us a head start, and now the cost of mapping has gone down and more companies will be able to develop their own maps as well," explains Mr Warsop. Today NU uses maps generated by hydrologists with data from various sources and surveys. "We also have our own team of modellers who check the quality of information we gather," he adds.

But Mr Allen is cautious: "There is an issue with developing your own mapping technology. Only the two or three top players have the resources to do so; it's not for the smaller insurers." Ms Saith agrees: "If you've got an in-house system that has proved to be reliable, that's fine. But a third-party company has more dedicated resources."

RSA has taken another strategy and is working with ESRI to develop a risk management solution based on its geographic information system mapping technology. This system enables flood levels to be predicted using computer simulation. According to ESRI's business strategy consultant Graham Wallace, this information can be linked to historic claims data to assess the relative risk of flooding on a property specific basis. RSA also combines this information with other property-specific risk data to enable the actuarial risks attaching to a specific property to be accurately assessed and priced.

While mapping technology and state-of-the-art flood maps should be developed and extensively used by the insurers to mitigate their exposure, Mr Adlington says that there are other things insurers can do. "They have to remain flood-conscious," he says. "When they hear that some part of the country will be subjected to particularly heavy rains, the insurers should advise their policyholders to move their cars to higher grounds, for example." This may not stop the flood or event, but an informed client, who is able to mitigate their own losses, is more likely to be a happy customer who will be more inclined to renew their insurance.

THREE DIMENSIONAL MAPPING

The summer floods, and the threat of climate change, have given rise to a number of companies developing new mapping technologies to better assess how cities will be affected by floods. One of these companies is Ambiental, which develops flood risk information for urban areas using three-dimensional digital city models. These models are coupled with mathematical algorithms to capture the complexity of flood risk within the urban fabric, modelling water flow down streets and around buildings.