**The 2013/14 floods: what do they tell us about**

**overall flood risk in England and Wales?**

Edmund C. Penning-Rowsell

Middlesex and Oxford Universities

Edmnund@penningrowsell.com

A recent paper of mine analyses the available data on flood damage since 1947 and up to 2010. The results show that annual average economic fluvial and coastal flood damage over the last two decades or so - a period seeing several large flood events - had not amounted to more than circa £0.25 billion (Penning-Rowsell, 2014[[1]](#footnote-1)).

Such analysis does not deny that floods can be serious in England and Wales, yet many commentators, including government ministers, the Environment Agency and their officials, have continued in the last five years to emphasise that this annual loss total amounts exceeds £1 billion, fundamentally based on the NAFRA-type assessments of flood risk that have been undertaken since 2002 (Gouldby et al, 2008) (NAFRA = **Na**tional **F**lood **R**isk **A**ssessment). As recently as 2012 the Climate Change Risk Assessment report on flooding and coastal erosion concluded that “Annual damage to properties due to flooding: between £1.7 and £4.5 billion by the 2050s, rising to between £2.1 and £6.2 billion by the 2080s (current figure: £1.2 billion)” (Defra, 2012, 2). The analysis in my paper concluded that “The four- to five-fold exaggeration – as we see it - does not sit well with the government’s commitment to good evidence based decision making” and that “Policy makers …. (and their Ministers) should refrain from referring to levels of … risk that are at best questionable and at worst quite simply erroneous” (Penning-Rowsell, 2014, XX).

It is instructive to update the analysis to the year 2014, not least because we appear to have serious flooding in the winter of 2013/14, as well as in 2012. This up-dating is only possible using residential flood insurance claims, from which we need to extrapolate to the likely overall total of both residential and non-residential losses (see below). Figure 1 shows the results, indicating that the years 2012 and 2013/14 are indeed above the average for the last 16 years, but that the mean of £0.146 billion is actually lower than the mean for the years 1998 to 2010 (the equivalent figure is £0.147 billion). This is because the year 2011 saw relatively few floods, although 8,000 properties made claims, yielding a total flood insured loss of no more than £52 million (£0.052bn) (Association of British Insurers (ABI), 2014a). It should be noted in this respect that all the figures here have been converted to national economic values, by deducting VAT, and converting the financial losses (those suffered by the householder), to economic losses to eliminate the "betterment" element in flood loss compensation as included in the insurance claims. (See Penning-Rowsell 2014, endnote 2, for details of this important correction).

As indicated above, Figure 1 shows the results for just the residential sector. The fraction of the total losses that are represented by this sector is not without significant uncertainty and variation. Results for the 2000 flooding show this fraction to be approximately 45.2%, whereas those for the 2007 floods gave a result of 37.9% (Penning-Rowsell, 2014). For the 2013/14 event, the ABI figures show that out of a total of £0.425bn claims total, some £0.276bn was for domestic cover (ABI, 2014b), yielding a 64.9% fraction for residential losses. Weighting the three results by the size of the total losses in each case gives an average a figure of 41.8% for the residential fraction of total losses. If we apply this average to the mean shown in Figure 1, and deducting the element attributable to Scotland (15.5%), we get total annual average loss/compensation of c. £0.294bn. Again this is less than one quarter of the figure quoted by the report on the Climate Change Risk Assessment, simply because the average for 2010-14 is almost identical to the average of the previous 16 years.

The reasons for the discrepancy between NAFRA results and recorded flood losses are not clear, but probably partly reflect the flood spreading model, introduced in NAFRA2008, which appears significantly to over-predict flood depths. In addition there are doubts about the fragility curves used to assess the chance of the failure of flood defences, which in reality are very rare in the UK. Both need investigation in a radical review of the NAFRA methodology and its data sources. Some of this is already under way.

Those disagreeing with these comments might raise three queries. First, what about agriculture? The agricultural losses incurred in the 2000 floods amounted to no more than 4.4% of the total (Penning-Rowsell et al, 2002) and the level of compensation to the Somerset Level farmers in 2014 has been only £10millions. So this category of loss is unlikely to be more than a relatively trivial sum within the national annual average total. Secondly, what about events greater than those likely to occur within a relatively short time period of 16 years? The answer here is that there have been no more than three floods in the last 120 years in England and Wales (1947; 1953; 2007) where the total economic damage exceeded £3 billion (and we are unsure if the 1947 flood reached that total, at today’s values). The likelihood therefore that the annual average currently extant in England and Wales is greater than £1 billion is very remote indeed. Thirdly, what about surface water flooding? But insurance claims include these sums, so the NAFRA-based assessment of current annual average losses greater than £1 billion, which only counts floods within the EA designated floodplain, should actually be lower than the insurance claim total, rather than circa four times its value.

So what do the floods of 2013/14 tell us? Despite their apparent severity, financial losses were not massive, at £0.425bn plus £22m for motor vehicle losses (the latter not assessed by NAFRA). There is therefore no new evidence here that national AAD is anywhere near the figures of up to £1.2bn coming from NAFRA. In that respect the results obtained and the conclusions reached in my Royal Geographical Society’s *Transactions* paper remain undisturbed, but the exaggerated and politically ‘embedded’ erroneous annual average flood loss figures remain a major cause for concern.

References

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4. Gouldby B, Sayers PB, Mulet-Marti J, Hassan M, and Benwell D 2008 A Methodology for Regional Scale Flood Risk Assessment *Proceedings of the Institution of Civil Engineers: Water Engineering* 161 169-182
5. Penning-Rowsell, EC 2014 A realistic assessment of fluvial and coastal flood risk in England and Wales *Transactions, Institute of British Geographers.* Published on line 22.3.2014. DOI: 10.1111/tran.12053.
6. Penning-Rowsell EC, Chatterton JB, Wilson T, and Potter E 2002 *Autumn 2000 floods in England and Wales: assessment of national economic and financial losses* FHRC, London

Figure 1.

Insured flood losses to residential properties in England and Wales 1998-2014

1. A small correction: the figure of £0.268bn in Table IV of that paper should be £0.322bn (to correct for insurance penetration). This does not affect the final (£0.25bn) average when given to 2 significant figures. [↑](#footnote-ref-1)