

## APPENDIX E. COMPARING THE FUTURE FLOOD EXPLORER TO PRESENT-DAY ESTIMATES

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## E.1 Validity of data provided on present day risks

These tests compare outputs of the FFE for the present-day with data provided by the national authorities and data available on present-day risks within Sayers and Partners. The results are summarised as:

- For **England**, the EAD estimate is consistent to within 10% of the values published within NaFRA (2018) (for flooding from rivers and the sea). The comparison of the estimates for surface water sources are not updated in NaFRA 2018; the estimate of £200m (used here for the purposes of validation) is based on discussions during CCRA2 (see Sayers et al, 2015). This is lowered than the published estimate of £290m (e.g. EA, 2014). The reason for the reduction was an attempted to account potential differences in surface water property counting between nations.
- For **Scotland**, counts of properties at risk agree closely with those provided by SEPA in aggregate, although the FFE assigns greater risk to fluvial and coastal sources and less to surface water. This reflects a consistent treatment of surface water within the FFE across the UK that is not necessarily consistent with the method of counting used in Scotland. In making this comparison, however, we assume direct damages can be determined by taking the total damage (as provided by SEPA) divided by 1.7. This is recognized as a simplification of the more local factors used by SEPA and makes direct comparison difficult. There is also likely to be some difference due to the treatment of defences (although this is difficult to determine without an in-depth exploration).
- For **Wales**, properties at risk agree closely. This reflects the use of the FFE structures within the recent NRW analysis, although for the CCRA3 the input flood hazard data is resampled to a 20m grid (from the native 2m grid).
- For **Northern Ireland**, the national flood risk assessment in 2018 provides the published results and the estimates from the FFE agree well with these.

Overall, the results of these tests provide some evidence that the FFE is reproducing present day risk adequately (as provided by the relevant bodies for the UK's constituent countries) and as such (given the assumption that the present day estimates are reasonable) the estimates of future changes will also be fit for purpose for the analysis presented here.

Some differences are expected as the FFE uses a different approach to the representation of defence breaching (typically stronger in the FFE than NaFRA analysis for the higher condition grades in particular for example) and different approaches used to determine whether a property is flooded by surface water. These differences tend to result in a lower estimate of damage from the FFE than published (in most cases) – but the difference is small. Although it has not been impossible to disaggregate the specific drivers of the differences in each country, an important difference is likely to be the surface water property counting methods and different assumptions that may be made at a detailed processing level. All of the assessments are also highly sensitive to uncertainties in property type (with significant 'unclassified' non-residential properties within the datasets) and whether or not a property is directly floodable (e.g. a ground floor or basement property). Effort directed to improving these basic inputs would significantly improve the confidence in the present-day estimates.

Comparison with the official figures highlights the difficulty in assembling consistent data sets across the UK, and comparing a UK consistent approach with figures from constituent countries, which are based on different hazard and risk assessment methods. The FFE uses the same approach across the UK, but in doing this, an exact match to the methods used by relevant authorities in the individual countries is not technically possible. Nevertheless, as the focus of this project is estimating changes in risk, rather than absolute values, our consistent approach is still valid, and avoids drawing false conclusions about spatial patterns of risk caused by different risk assessment methods in different countries.

**Table 1 Comparison between present day risk estimates provided by flood risk management bodies and those from FFE**

	UK	FFE - UK	England	FFE-England	Wales	FFE-Wales	Scotland	FFE-Scotland	NI	FFE-NI
<b>Expected Annual Damages</b>										
<b>Residential - Direct economic damages (£m)</b>										
Fluvial and coastal	£359	£341	£246	£231	£63	£52	£45	£51	£5	£7
Surface Water	£167	£150	£74	£60	£44	£47	£32	£29	£17	£14
Total	£526	£492	£320	£291	£107	£99	£76	£80	£22	£21
<b>Non-Residential - Direct economic damages (£m)</b>										
Fluvial and coastal	£522	£486	£418	£328	£40	£42	£55	£101	£9	£14
Surface Water	£224	£198	£126	£135	£14	£15	£60	£21	£24	£28
Total	£747	£684	£544	£463	£55	£57	£115	£122	£33	£42

## E.2 Verification of future flood risk estimates

It is not possible to conduct a meaningful comparison of future flood risk estimates because of the significant differences introduced by the assumptions relating to:

- Population growth
- Climate change
- Adaptation actions

Assumptions made across different studies (for example the EA Long Term Investment Scenarios) vary significantly in all of these aspects. These differences make comparison for the purpose of validation meaningless.

The underlying projections of population (from Cambridge Econometrics) have been widely reviewed and taken here as valid. Internally we have undertaken independent checks that the data taken into the FFE faithfully reflect the inputs (noting that here we do not remove properties or people in areas of reducing population). Similarly, the UKCP18 data are assumed to have been independently validated as well as the analysis using the Grid-2-Grid and overtopping responses.

The credibility of adaptation responses has been ensured through exchanges with various stakeholders including national policy leads. It should be noted however that this process was not undertaken to agree the adaptations used here but to discuss the supporting evidence. The chosen values are those determined by Sayers and Partners and may not represent the views of the national leads.

## E.3 Bibliography

The information in this Appendix is taken from a combination of personal communication and:

- For England: State of the Nation Technical Briefing and Long-Term Investment Scenarios (LTIS) 2014
- For Scotland: Scotland’s National Flood Risk Assessment 2018 published by SEPA (website is here: <https://www.sepa.org.uk/data-visualisation/nfra2018/>).
- For Northern Ireland: NI’s National Flood Risk Assessment 2018 <https://www.infrastructure-ni.gov.uk/publications/northern-ireland-flood-risk-assessment-nifra-2018>
- For Wales: Unpublished Flood Risk Assessment Wales (FRAW) (data provided has been processed here to provide the numbers presented – they are not official figures from NRW as unpublished)