

Response-2 Creating storylines manuscript

By Natasha Pullan and Onno Bokhove

Text for both reviewers

Thank you for your helpful comments. A quick summary: Overall, the text can be shortened by circa three pages. The old sections 4.1 and 4.2 can be moved to an updated "Methodology: ..." section 2. The old sections 3 and 4 can be combined in an updated section 3 "Results: ...". Subsection 5.2 will be moved to a new Appendix A, yielding a shortened updated or new "Results: ..." section 4 (old section 5). The difference between the scientific storylining in the main text and the additional "story" can be explained more extensively. The replicability of the storyline approach will be highlighted in extra explanations. All footnotes will be folded into the text and three figures can be removed. All changes except for some minor ones will be highlighted in coloured texts in a revised manuscript, for your (and our) ease of verification. Note that additional comments were made online prior to these responses. Furthermore, to be sure that what we state in our replies can be done truthfully, the proposed changes have already been implemented in a draft manuscript revision.

Comment reviewer-2

The FEV Methodology proposed in this paper is, in my view, rather interesting as a straightforward modelling protocol for evaluating and communicating the cost-efficacy of different combinations of flood-mitigation measures. I think that the methodology is robust, quite easy to understand and follow. I have a few comments to improve the paper:

Reply: Thank you for your valuable comments and efforts. Note that some of the comments below are also addressed in (more elaborate) responses to similar or related comments made by reviewer-1. See also the additional and/or preliminary comments on your reply made on 16-09-2026 by co-author OB.

1. The title is - to some extent - misleading. In my view, the role of 'storylines' is not as central as the title would suggest. I would recommend revising the title and/or the text accordingly.

Reply: We can revise the title and text accordingly but did realise during the revision that larger parts of our work, than initially highlighted, do seem to fit the scientific storylining approach. That realisation can be highlighted in newly added explanations (in coloured text). Our new title suggestion is: *"Storylines on floods: climate-change uplift of extreme River Aire flooding events and the cost-efficacy of flood mitigation"*.

2. *The FEV methodology is established and already published. I would ask authors to better highlight the value added and element of innovation related to the present work compared to what has been already published.*

Does it only relate to climate change impact modelling?

If this is the case, the paper could look as an 'extension' of a previous work.

I think it would be great to better detail the novelty.

Reply: The FEV and cost-effectiveness methodology is also viable prior to climate-change uplifts, see the referred to literature (ours and others) hereon.

By including climate-change effects to FEV, the routes can be twofold:

(a) via climate-change uplifts factors our three-panel methodology is new, since rather than going from water level to discharge (as is generally needed in the pre-climate works since water level is frequently measured while discharge tends to be inferred from less-frequent discharge measurements and simulations through a rating curve), in the uplifted cases we go from discharge to water level via the presented reconstruction; and,

(b) when full climate-change simulations are available the standard FEV route applies.

However, the advantage of the uplift approach is that (at least in England) all data and uplift factors are freely and widely available. While having full-fledged climate-change simulations may be better, i.e. more accurate, these are not as widely available and using simulations with additional FEV analyses will require (much) more work. The uplift factor route (a) used is quicker, since the simulations and estimates in the uplift factors are provided to us by UK Government, and available across England, in what must have been a large computational effort; the result of which efforts we simply use as the given uplift factors. We can highlight the above better in a draft revised manuscript.

3. *Is the methodology directly replicable elsewhere?*

Reply: The three-panel graphs and square-lake graphics with climate-change uplifts are directly replicable, as can be emphasised more in the revised text hereon. See also OB's preliminary online comments of 16-09-2026 and the reply under 2 above.

What are the requisites?

Reply: Requisites are measured (i.e., real) or simulation data (water-level and discharge) at relevant prime locations along a river with the climate-change uplift factors or full-fledged climate simulations.

This is particularly true for the estimate of costs, that is not all clear to me. How is it performed? Is it site specific?

Reply: No, alas, the costings are site-specific and will likely remain difficult to obtain since these tend to stem from (more hidden and less available or unavailable) government data, in that they are not openly available academic or UK Government data. This is the unfortunate burden of considering real, ongoing and changing mitigation cases and works. Students in projects, circa 30, over the years have

expressed frustration at the difficulties in obtaining cost figures, such as to establish or estimate the information for the cost-effectiveness graphics. There may be cost groupings possible, as the reviewer suggests, but this remains to be seen.

4. Concerning the potential evolution of the work, I think it would be interesting not to limitate the analysis to a monetary evaluation as typically NBS have a lot of 'other' advantages (co-benefits).

Reply: We agree. We can add remarks on the natural value of NBS; we had already lowered the AFM costing attributed to flooding accordingly (in a rough estimate); we can highlight that a priori as well (in a tentative and already made new section 4.1, moving section 5.1). However, sometimes the flood benefits are secondary while the natural value is dominant in NFM, e.g., as in the beaver case, and then an appropriate cost partitioning clarifies what the flood benefit costings are. However, in the end assigning a value to the additional benefits is required to permit a comparison. Also see OB's poster (via OB's webpage or LinkedIn) and abstract presented at the EGU2025, on info-gap theory, where OB quantifies NBS when no (monetary) value is known.

I would ask the authors to elaborate a bit more on this, as well as on the other potential evolutions of the FEV.

Reply: We can update a paragraph of the discussion in the concluding section according to the requested elaboration. Not mentioned are potential evolutions of FEV for surface-water flooding in urban settings, some of which OB did mention in his additional online comments on 16-09-2026.