

## Reply to editor

The authors would like to thank the editor for his careful reading and technical comments. The technical corrections have all been incorporated, as discussed below, and the revised manuscript has been uploaded.

Yours sincerely,

Beatrice Dittes

on behalf of all co-authors

### Technical corrections

Editor comments are marked in *blue*.

*p3/11-5: The sentence “When combining...” seems to be a bit out-of-sync to me, because you are moving from a paper specific statement in the sentence before back to a very general statement. I would recommend to swap and slightly rephrase the first two sentences on p3.*

The sentence in question is also meant as paper specific, which we clarify by formulating as follows:

*“In this paper, we show how to incorporate into the flood planning process the visible uncertainty from an ensemble of climate projections as well as hidden uncertainties that cannot be quantified from the ensemble itself but may be estimated from literature. In the process of combining these uncertainties, we account for uncertainty and bias in projections as well as for dependencies among different projections.”*

*p6/14: SRES should be defined here (instead of p7/125)*

Done.

*Table 1: Are the indentations (e.g. for “Hydrological model”) really needed? I would remove them.*

Done. This was an error in formatting on our part.

*Table 1: What is R1 to R3?*

We have added the following explanation in the header: “R1-R3 denote distinct model runs”.

*p11/125: I would move the explanations of aleatory and epistemic uncertainty to Section 2.3, where the word aleatory is used the first time*

We agree that the term should be introduced at its first mention. However, since we think a short discussion of aleatory vs. epistemic uncertainty fits better at p11/125 than in Section 2.3, we chose to remove the term from the latter, rather than elaborate on it there: “The term ‘internal variability’ describes the irreducible uncertainty component in extreme discharge: even with perfect knowledge, it cannot be predicted deterministically [...]”

*p14/l24: Should the estimate of  $q(1)$  be shown Figure 4?*

We feel that the Figure itself is quite full already, but we clarify now in the description and caption that the estimate corresponds to the peak of the PDF:

*“Since the estimate of  $q^{(T)}$  – the peak of the PDF – changes as new data becomes available, the capacity of the flood protection system will be re-evaluated in the future, and possibly be adjusted.”*

**Figure 4.** *Original and updated PDF based on a period of high new observations of annual maximum discharge. Because the original PDF is so broad, the period of extreme observations results in a strongly shifted updated PDF, the peak of which (corresponding to the estimate of  $q^{(1)}$ ) crosses the protection boundary level. Thus, the protection system must be adjusted.”*

*p16/l25: ...and a discounting...*

Done.

*Throughout the paper the term "learning" is used in relation to estimation of distribution parameters. "Estimation" is the commonly used term in statistics.*

We modify the text to use „estimation“ when referring to the classical statistical estimation of the distribution or model parameters. We still keep the broader term “learning” in some contexts.

*It is not common to include multiplication signs "x" in equations.*

Changed throughout.

*Text above table 3. I expect you refer to trend in mean annual maximum discharge and not mean discharge.*

Yes, was corrected.