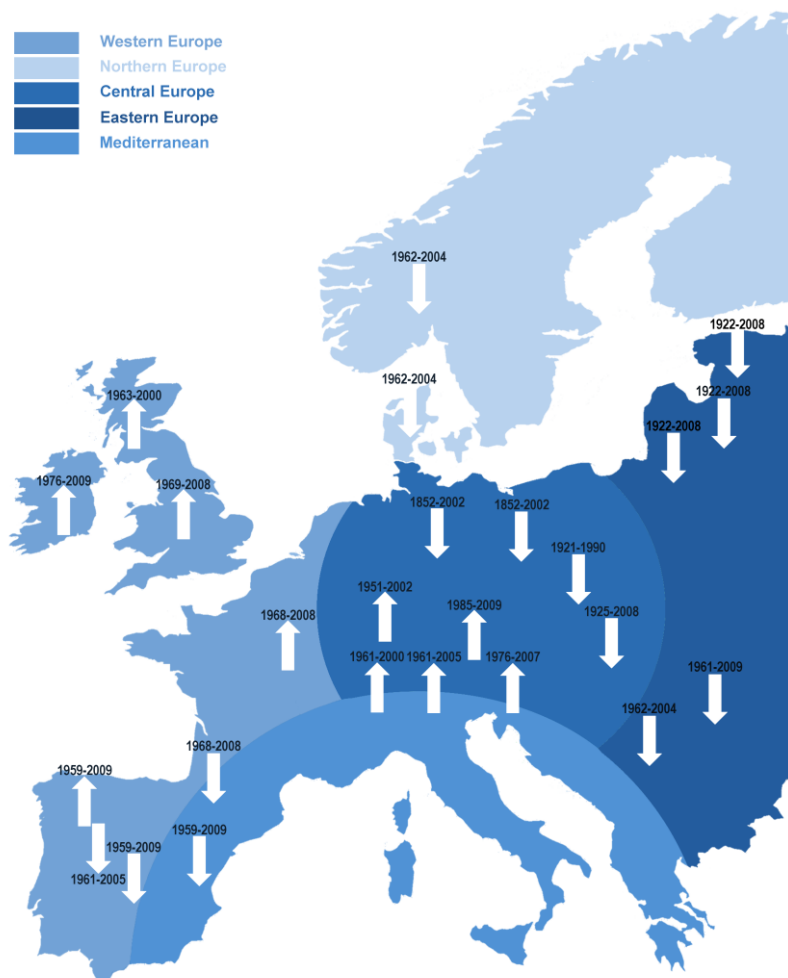


**Response to comments of Anonymous Referee #1 and #2 on:  
"Understanding flood regime changes in Europe: a state of the art assessment"**

First we would like to thank the two referees for providing their opinion on our review article. Below we will address the comments of the referees that had not been answered in the previous discussion.

**Response to Anonymous Referee #1 and #2**

For section 2.2, both referees suggest to summarise observed flood regime changes. For ease of interpretation of the results we will present the complex picture in a schematic (see the new Figure below) showing observed flood regime changes from the literature reported in the text.



**New Figure 4:** Schematic summarising the observed flood changes in Europe derived from cited studies using different not directly comparable change analysis methods and time periods. Note: Arrows in the schematic indicate the majority of trends including regions with weak and/or mixed change patterns. Areas with no/inconclusive studies due to insufficient data (e.g. Italy) and inconclusive change signal (e.g. Sweden) are not shown.

For section 3, it has been suggested to omit the general discussion on scenario analysis in the revised version of this manuscript. Instead of discussing the origin of the term scenario (i.e. the Shell example), we will focus on the usefulness of being explicit about the different futures and associated uncertainties that are made when scenarios are being used.

## Response to Anonymous Referee #2

Regarding the general comment on the length of the paper, we would like to keep the paper in the current format and avoid splitting it. We believe that a key strength of this review paper is that it combines the methods used to detect flood regime changes and also the detected changes together with the challenges and opportunities. To illustrate the detected changes we will add a figure that shows where and when the changes have been observed.

Response to the detailed comments:

1. Page 15538: The referee comments on the shortage of information on the magnitude of observed flood changes. We agree that the information on the magnitude of change is an important part of the change signature. However, as mentioned in the manuscript, the studies used different methods and time periods to detect flood changes which results in a complex picture of change. Therefore, less attention is given to the actual magnitude of change. Additionally, most studies only test for significant change (e.g. using the Mann-Kendall test) and do not report on the magnitude. We will clarify to the reader why the magnitude is not available or not comparable for most of the studies.

2. Section 2.2.1: As requested by the referee and already mentioned above we will include an additional figure to summarise the complex pattern of changes into a general picture.

3. Page 15548: The focus on flood-poor and flood-rich periods is indeed an important point. Therefore, as suggested, we will discuss the possibilities for prediction and design associated with the analysis of flood-poor and flood-rich periods.

4. Pages 15551/52: Regarding discussion on scenario analysis; please see combined response to both referees above.

5. Page 15553: The referee suggests shortening the section on river hydraulics. We agree that for some part of the readership the points listed here might not be new, however for the broader audience in Earth Sciences we consider this kind of information beneficial. This also applies to the other sections, which the referee suggested to shorten. Reducing this or other sections would change the consistency with the other drivers of change (i.e. sections).

6. Section header 3.3 should indeed be extended by “- challenges and opportunities”. This part of the caption got lost in the typesetting process. Thank you for pointing this out.

C82597. Figure 7: Trend magnitudes are calculated using linear regression applied to time series with a minimum length of 30 years up to a maximum length of 180 years for all possible start and end years between 1828 and 2008. To clarify this, the caption will be changed accordingly.