We would like to thank the reviewers for their constructive and valuable comments on our manuscript. We are committed to addressing the concerns in a revised version, and provide our more detailed responses below:

Responses to RC1: 'Comment on egusphere-2026-2697', Anonymous Referee #1, 26 Aug 2026

This manuscript provides a broad overview of the ClimXtreme-1 program and synthesizes 21 papers from the inter-journal special issue together with 33 related peer-reviewed publications. It covers heatwaves and droughts, heavy precipitation and floods, wind storms, event attribution, impact studies, and the shared XCES infrastructure. The manuscript is potentially useful as a reference for readers interested in European weather extremes, and the attempt to connect process understanding with probabilistic and storyline attribution is interesting. However, although the paper tried to make several broad project-level and causal conclusions, the paper is poorly organized and it is more of a collection of individual research reports, without sufficient synthesis and summary. The basis of the synthesis, the scope of the review, and the reproducibility of the presented resources need to be explained more clearly. The following comments may help improve the manuscript. The paper should try to illustrate adequate innovation achievements briefly and seriously, as this is seemingly pan-European cooperation and your government surely support you a lot. Overall, this manuscript requires greatly major revisions before it is suitable for publication.

Major Concerns

--Try to improve the Introduction section carefully

We agree that the introduction should be more concise, focusing on the overarching concept of bringing process understanding, statistical and impact related aspects together along with data. We will also clarify that the overall concept was not to develop a specific sequence of individual scientific approaches streamlined to a particular event type, but the realization of a network of such approaches which can be used to address the general questions about such events raised by different stakeholders and society, looking at them not just from one but from different angles. This was more thoroughly applied in the second phase of the ClimXtreme program, and surely this subsequent application must be indicated in the introduction. As the papers in the special issue focus more on outcomes of the first phase, our intention is to explain the role of the individual outcomes within the overall concept.

The "1.1 Scientific Background" herein is not necessary, as the background of ClimateExtreme has been illustrated below. Please simplify or remove it.

We will just explain the background to the minimum required for setting the scene.

Figure 1 should be removed or move to the supplementary file. Make no sense herein.

We agree that the scientific community should know the content of Fig. 1 in principle. However, as an *iconic* figure illustrating the climate change problem itself with the CO2 concentrations being an extreme event by its own, we intend to integrate it to the conceptual figure demanded by reviewer 2 for the moderator/mediator concept.

The "1.2 The ClimXtreme Project" is worthy of being introduced as much as possible, particular for perspectives and highlights. Therefore, I suggest this sub-section should be treated carefully, introduced briefly (as the whole paper illustrate them) and divided into several parts.

Thank you for this suggestion! Indeed, this kind of organization of the text is what we wanted to realize, but rather than giving details in section 1.2 (which can be integrated into the introduction without being an extra sub-section), we explain them in section 2 which already has sub-sections.

--section 2

Several sketch maps or workflow is important in this section rather than verbose paragraphs.

Thank you for this suggestion! We will adapt an already existing sketch and shorten the text accordingly.

According to Line 114, "the process" in caption of section 2.1 is referred to as near-surface process. However, Line 14 in Abstract claimed the "dynamic process studies", but throughout the paper, there are no enough evidence for conclusion of dynamic processes, therefore, please weaken it.

Regretfully, our wording in this section regarding "near-surface processes" was not very clear. We want to distinguish the processes taking place in the free atmosphere and the extreme events observed and felt (with respect to impacts) at the surface. We see the former processes (like, for example, travelling cyclones) as mediators, themselves potentially influenced by the global change, which kind of "set the scene" for an extreme at the surface. On the other hand, there are processes moderating the extremes at the surface directly, like the large-scale temperature increase moderates the intensity and frequency of heatwaves. We will clarify this distinction better, also adding the examples.

--section 2.4
Please list data bases including detailed information as specific as possible (user-friendly), rather than many literature reviews and Figure 2.

We assume that the reviewer meant section 2.5 rather than 2.4, as this is related to the data bases. We re-assessed section 2.5, and agree that it is a mixture of concept description and results, thus contributing to the lack of a clear organization of the manuscript. We will change this by removing the non-conceptual part from section 2, and combine it with section 2.6 into a part of structural outcomes of the project as part of section 3. We think that this will help to resolve the problem regarding the paper's organization.

--Section 3: Transparency of the literature synthesis & Lack of research highlight

Section 3 states that the manuscript provides a comprehensive summary of 21 special-issue papers and 33 papers published elsewhere. However, as the section title is Hazard-specific research highlights, neither explicit and brief highlights, nor sufficient synthesis, are displayed. In addition, Lines 260-315 are redundant because each hazard has been illustrated below. Please simplify it.

The relevant numbers partitioning the total number (21 SI / 33 elsewhere) of manuscripts will be broken up into the contribution to each hazard type. This revised approach allows to highlight results of hazard specific papers with respect to the goals of ClimXtreme-1, e.g the joint analysis of the heat wave in summer 2018 merging several single subproject result in a unified view, the advantages of using regional climate models at convection permitting grid sizes to provide realistic rainfall information for risk assessments or the review paper on strategies on risk assessment for wind storm damages in different economic sectors. Lines 260-315 are only partly redundant to the following sections as all non-special issue published manuscripts are mentioned in their hazard respective context. During revision this part will be reformulated ("simplified").

Some indices in Table 1 are common sense rather than unique for the ClimateExtreme projects, please only list the newly proposed and robust indices in Table 1. Section 3.3 "3.3 Extratropical Cyclones" is not mentioned in Line 291.

The intention is not just to list newly proposed of particularly robust indices. A relevant outcome of the project we want to convey is the fact that a particular hazard can be quantified by different (including "common sense") indices, but these often do not quantify the same phenomenon. We want to follow a suggestion made by Reviewer 2, introducing a specific lay-out for that table which can be used to describe the new/ClimXtreme internal indices vs those „common sense" indices from the literature. Further, comparable tables to Table 1 will be generate covering indices for windstorms and heavy precipitation with emphasis on the ClimXtreme contributions and strengthening the synthesis issue of the current manuscript.

--Geographic and hazard scope should be made consistent

The title refers to European atmospheric extremes, whereas many parts of the paper focus more narrowly on Germany or Central Europe. In addition, the introduction names four WCRP archetypes, including severe convective storms, but Section 3 is organized into three main hazard groups, with convective storms and floods included only within other sections. The heatwave and drought section also contains a detailed index table that has no parallel for heavy precipitation or wind storms. Please define the geographic and hazard scope at the beginning, explain the grouping choices, and use a more parallel structure across the hazard sections. If the available literature is uneven among hazards, this imbalance should be stated as a limitation of the synthesis.

As this point has also been mentioned by Reviewer 2, we will put an an extra effort to clarify the geographic scope and the related results. The three hazard types in *ClimXtreme* are those defined by WCRP, except for the tropical storms which have not been considered in *ClimXtreme* due to its geographic focus on Central Europe. To signal this geographic focus we suggest changing the title of the manuscript into

Past and future meteorological extreme events impacting central Europe – the ClimXtreme program's structure and results

Minor Issues
Thank you for identifying them. They will all be accordingly in the revised version.