

First of all, the authors want to thank the referee for the work and time devoted to review the manuscript. We know that all comments will serve to improve the quality and understanding of the work and we hope we have properly answered all the suggestions.

## Reviewer #1:

### **Summary**

*The study demonstrates two operation strategies for flood mitigation in the lower Tagus valley. The Tagus is the largest river on the Iberian Peninsula and the study focuses on flood mitigation by means of regulating the largest dam of the river, the Alcántara dam. The Iber+ model is employed together with a pre-selected digital elevation model (Copernicus) to conduct the simulation of river flow and operating strategies in hindsight at the example of five flood events between 1972 and 1997 with a focus on the major flooding in 1979.*

### **Evaluation and Recommendation**

*The manuscript is an interesting case study to the highly important field of flood mitigation. The topic of this manuscript is suitable for the journal.*

*The manuscript is overall well-written and extensively referenced. Data and software that were used are freely available and data sources are referenced. Appealing maps are provided as figures to illustrate the site of investigation.*

*While the content might be valuable to readers that are interested in flood mitigation operation strategies, the presentation of the material requires some restructuring and elaboration. One of the major points in this respect is that the results section includes many statements that should rather be presented in the introduction and in the methods section. In the current form, the actual results are presented between many of these additional statements and references, and key insights are therefore hard to elicit. Content-wise, the line of thought can be followed but the reader gets the impression that a step beyond is missing: As addition, it would strengthen the manuscript if there were a comparison with other operating strategies that are mentioned (see, e.g. l. 273-275) but not further pursued. Alternatively, an uncertainty analysis using noise that is added to the historic data (like perturbed precipitation data) could demonstrate the applicability of the proposed operating strategies beyond the deterministic hindsight scenario, specifically w.r.t. to the suggested operation strategy 2.*

*The manuscript bears the potential for being a valuable contribution to the field once the points laid out here are addressed. My recommendation therefore is major revision. In my comments, I suggest changes about restructuring the article. These shall outline one way to do it and do not have to be followed strictly. Yet, an iterated presentation of the material is required.*

The authors would like to thank the reviewer for the valuable comments.

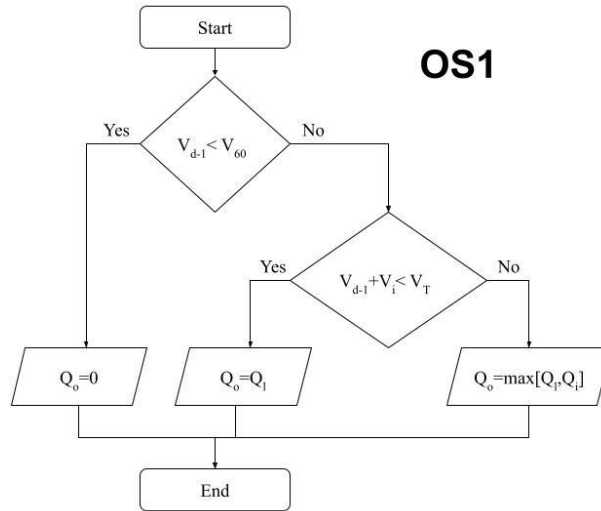
Following the reviewer’s suggestions, the article was restructured and some of the statements previously included in the Results and Discussion section are now included in either the “Introduction” or in the “Data, Models and Methods” sections, hopefully providing better structuring of the manuscript. Additionally, a more in depth analysis and comparison with other operating strategies are also carried out in the new version of the manuscript.

In addition, the hindsight scenario with historic river flow data was perturbed in order to test more in depth the performance of the dam operation strategies proposed. In this sense, random perturbed series were generated allowing a deviation of  $\pm 25\%$  from the original values, that is, each real daily value of river flow has been allowed a random variation of  $\pm 25\%$ . In this sense, as many perturbed random series as total days of the original series ( $> 17000$ ) were generated to add more robustness to the results. Finally, the average number of floods generated by the river flow of the perturbed series (perturbed natural regime) as well as the associated standard deviation, were presented in a new table. Likewise, the mean number of floods (and the respective standard deviation) generated by the river flow of the perturbed series but applying operating strategies 1 (OS1) and 2 (OS2) was also evaluated and presented in the new table. In all cases, the proposed strategies provide an important reduction in the number of floods, and additionally, the efficiency of OS2 to mitigate the most extreme floods was also confirmed. This corroborates the robustness and the applicability of dam operating strategies proposed under different scenarios of river flow. This information was added in the new version of the manuscript.

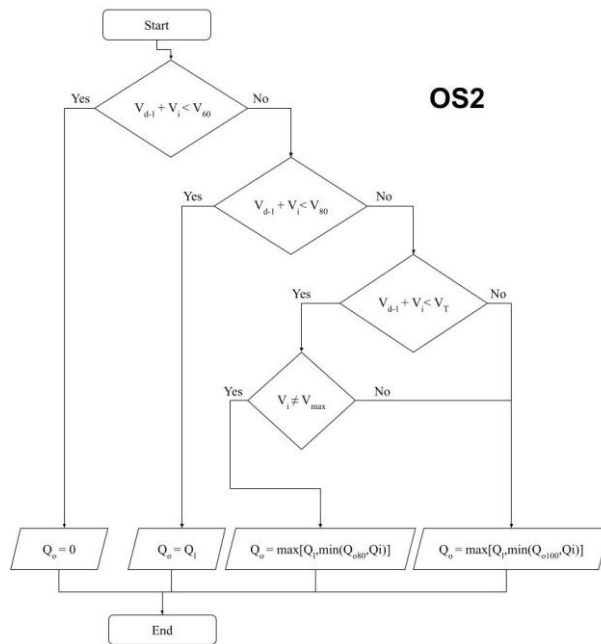
Parameter	Natural Regime	Operation Strategy OS1	Operation Strategy OS2
<i>Days &gt; 1000 m<sup>3</sup>s<sup>-1</sup></i>	453.97 $\pm$ 87.63	77.64 $\pm$ 3.34	89.05 $\pm$ 3.57
<i>Days &gt; 3000 m<sup>3</sup>s<sup>-1</sup></i>	37.98 $\pm$ 3.16	16.13 $\pm$ 2.05	14.42 $\pm$ 2.28
<i>Days &gt; 5000 m<sup>3</sup>s<sup>-1</sup></i>	6.98 $\pm$ 1.61	3.65 $\pm$ 0.88	1.66 $\pm$ 0.98

**Table.** The original series of real inflow at Alcántara location was perturbed by applying a random deviation of  $\pm 25\%$  to the daily river flow values. Thus, several random perturbed series equal to the total number of days from the original series ( $> 17000$  days) were created. Then, the mean number of days (and the corresponding standard deviation) exceeding different critical outflows at Alcántara location, were calculated for the perturbed river flow series, considering a natural regime and also, applying the operation strategies OS1 and OS2.

Finally, the authors made an effort to make relevant information more accessible and, in particular, the proposed operating strategies were presented in flowcharts for ease of understanding in the new version of the manuscript.



**Figure.** Flowchart of the dam operation strategy 1: OS1.  $Q_o$  is the controlled outflow,  $Q_i$  is the security outflow level ( $1000 \text{ m}^3\text{s}^{-1}$ ),  $Q_i$  is the river inflow,  $V_i$  is the inflow volume,  $V_{d-1}$  is the dam volume of the previous day,  $V_T$  is the total capacity of the dam and  $V_{60} = 0.6 \times V_T$  (corresponding to BFL = 60%).



**Figure.** Flowchart of the dam operation strategy 2: OS2.  $V_{80}$  is the volume considered as the security Base Filling Level for extreme events, considered as 80% of dam capacity ( $V_{80} = 0.8 \times V_T$ ).  $V_{max}$  is referred to the day when the peak of the event is expected.  $Q_{o80} = Q_i + (V_{d-1} - V_{80}) \times \frac{10^6}{60 \times 60 \times 24}$  is the outflow which allows maintaining the volume of the dam at 80% of its capacity and  $Q_{o100} = Q_i + (V_{d-1} - V_T) \times \frac{10^6}{60 \times 60 \times 24}$  is the outflow that allows not to exceed the dam capacity.

### *Specific comments*

- *Abstract: “...several dams...” is stated, but only the major Alcántara dam is regulated under historic data, right? Please make sure to not raise wrong expectations in the abstract.*

**The reviewer is correct. The statement was not entirely clear in the original abstract. We have changed this sentence to clarify that the dam operating strategies were only applied to the Alcántara dam, the most important for the Tagus river.**

- *l. 26: “...with the proposed strategies”. Briefly name what is the core idea behind the strategies already in the abstract.*

**This was included in the new version of the manuscript.**

“... In this sense, dam operating strategies were developed and analyzed for the most important dam along the Tagus river basin in order to propose effective procedures to take advantage of these infrastructures to minimize the effect of floods. Overall, the numerical results indicate a good agreement with water marks and some descriptions of the 1979 flood event, which demonstrates the model capability to evaluate floods in the area under study. Regarding flood mitigation, obtained results indicate that the frequency of floods can be reduced with the proposed strategies, which were focused on providing optimal dam operating rules to mitigate flooding in lower Tagus valley”

- *Provide a clear “Motivation” or “Objective” section. The intention of the paper becomes clear over when reading the article, but it is preferable to have the goals clearly stated at some point – this is also something the final conclusions can relate to. One important motivation that is worth mentioning might be that a thought-through operation strategy is a low-cost approach for flood mitigation compared to additional structures that have to be build.*

**Done. A new section 2. Motivation, was developed.**

#### **“2 Motivation**

The main motivations driving this study are, on the one hand, to improve the knowledge and understanding of flood development in lower Tagus valley, an area especially vulnerable to these events. In this sense, one of the main motivations for carrying out this analysis was the scarcity of studies addressing this issue, especially from a hydrodynamic point of view. For that, different freely available products were tested in order to provide the most accurate tools that can serve as a basis for future studies focused on addressing different aspects related to flooding in lower Tagus valley. On the other hand, the study also intends to provide different strategies to mitigate floods in lower Tagus valley but taking advantage of existing infrastructures, in particular, the dams. To the best of our knowledge, there are no previous studies that

have developed this type of strategies for the area under scope, so the strategies presented in this work could represent an important advance in this field. This proposal will allow to provide an affordable new approach to flood mitigation compared to the implementation of additional structural measures that have to be built. For that, dam operating strategies will be proposed and tested in the most important Tagus dam. The benefits provided by the dam strategies proposed in relation to flood mitigation, will be also evaluated. This will also serve as a basis for developing future studies focused on optimizing dam strategies or even interconnecting the strategies of different dams of the Tagus basin to improve the flood mitigation.”

- *Section 2: Please explain why the Alcántara dam is the only one considered here and whether there are other operating strategies that include other structures as well.*

**The Alcántara dam is by far the one with the largest capacity of the dams located along the Tagus basin, which, together with its location, on the border between Spain and Portugal, implies that the Tagus river flow in the Portuguese sector is, to a large extent, controlled by this dam. Therefore, taking into account that one of the main objectives of this work is to propose dam strategies to help in the mitigation of floods in lower Tagus sector, we opted to develop and apply dam operating strategies only to this dam. Thus, here we want to show an example of how an adequate regulation of this dam alone could prevent or, at least, strongly mitigate floods in lower Tagus valley. This could provide a basis for further works that can take advantage of the information and results presented here, namely to apply different strategies along the entire Tagus basin, or even interconnect the strategies of different dams, to make improved and more efficient strategies to flood mitigation in Tagus river. This was clarified in the new version of the manuscript.**

- *Section 3: rephrase as “Data, Models and Methods”*

**Done.**

- *Section 3: merge 3.1 – 3.4 in subsection “Data”*

**Done.**

- *Section 3: great public resources!*

**Thanks. We always try, as far as possible, to conduct the studies with public resources in order to facilitate the transfer of the knowledge acquired.**

- *L 92: please add which distance is resembled by 0.1° in km*

**Done.**

“0.1° ( $\approx$  10 km)”.

- *L .120ff: please explain in more detail why the model was operated the chosen way: why was the inlet chosen to be critical/subcritical? Why was the outlet chosen to be supercritical/critical? Are these conditions static or do they change over the time series? Why was the SCS-CN methodology by Mockus (1964) used for getting the infiltration from precipitation – are there no more recent and potentially improved alternatives?*

The inlet of the model was defined by means of the critical/subcritical condition because it allows reproducing the real conditions of the river flow using as input the values of the time series of Tagus river flow registered at the gauge station located in Almourol (inlet area of the numerical domain). Other types of inlet conditions depend on other parameter that can suppose an additional source of uncertainty. The outlet was defined as supercritical/critical condition since it allows reproducing with reasonable accuracy the river flow situation, taking into account that no control stations are located at this point and, therefore, no data of river conditions were recorded. Both boundary conditions (inlet and outlet) allow, in our view, a good balance between accuracy and simplicity, since other conditions can only be defined using more data that, in this case, cannot be accessed. These conditions remain static during the simulations. This kind of inlet and outlet conditions were successfully applied in other works where flood hydraulic simulations were carried out, obtaining accurate results (Fernández-Nóvoa et al., 2020; Santillán et al., 2020; González-Cao et al., 2021; 2022). This rational was further clarified in the new version of the manuscript.

Regarding the SCS-CN methodology, the reference of Mockus (1964) refers to the initial development of this methodology, which is currently widely used to estimate the runoff in extreme flood events (Beven, 2012; Wang, 2018; Fernández-Nóvoa et al., 2020). In the new version of the manuscript the bibliography was updated and more information about this methodology was added.

Beven, K.: Rainfall-Runoff Modelling: The Primer, 2<sup>nd</sup> Edn., Wiley-Blackwell, Chichester, UK, 2012.

Fernández-Nóvoa, D., García-Feal, O., González-Cao, J., de Gonzalo, C., Rodríguez-Suárez, J. A., Ruiz del Portal, C., and Gómez Gesteira, M.: MIDAS: A New Integrated Flood Early Warning System for the Miño River, *Water*, 12, 2319, <https://doi.org/10.3390/w12092319>, 2020.

González-Cao, J., Fernández-Nóvoa, D., García-Feal, O., Figueira, J. R., Vaquero, J. M., Trigo, R. M., and Gómez-Gesteira, M.: The Rivillas flood of 5–6 November 1997 (Badajoz, Spain) revisited: An approach based on Iber+ modelling, *J. Hydrol.*, 610, 127883, <https://doi.org/10.1016/j.jhydrol.2022.127883>, 2022.

González-Cao, J., Fernández-Nóvoa, D., García-Feal, O., Figueira, J. R., Vaquero, J. M., Trigo, R. M., and Gómez-Gesteira, M.: Numerical reconstruction of historical extreme floods: The Guadiana event of 1876, *J. Hydrol.*, 599, 126292, <https://doi.org/10.1016/j.jhydrol.2021.126292>, 2021.

Mockus, V., 1964. National engineering handbook. US Soil Conservation Service. Washington, DC, USA, 4.

Santillán, D., Cueto-Felqueroso, L., Sordo-Ward, A., Garrote, L.: Influence of Erodible Beds on Shallow Water Hydrodynamics during Flood Events, *Water*, 12(12), 3340, <https://doi.org/10.3390/w12123340>, 2020.

Wang, D.: A new probability density function for spatial distribution of soil water storage capacity leads to the SCS curve number method, *Hydrol. Earth Syst. Sci.*, 22, 6567-6578, <https://doi.org/10.5194/hess-22-6567-2018>, 2018.

- *L 124: which sizes: side length or circumference?*

**The side length. This was clarified in the new version of the manuscript.**

- *L 126: "...tries to reproduce..." Does it only try to reproduce? Of course it is a simulation, but please*

**The sentence was rewritten as follows:**

"Several simulations were used here. The first (Simulation\_Control\_1979) is focused on reproducing the spatial extension and depth of the flood observed in the lower Tagus section in the 1979 event, considering the historical timing and magnitude of water released by the main dams upstream as well as the precipitation downstream."

- *L 147: please describe why a Taylor diagram was used and how it works, i.e. that it is a tool for visualizing multi-objective optimization*

**A Taylor diagram is a very suitable tool that provides a concise statistical summary of how a pattern matches with other (Taylor et al., 2001). It allows representing multiple statistics in a compact single diagram. In particular, Taylor diagrams provide a way of plotting together three well known model validation statistics to carry out this comparison, in this case the correlation coefficient, the normalized root mean square difference and the normalized standard deviation. Thus, the correlation coefficient provides information about the similarity pattern of the target and reference series. The normalized root mean square difference allows quantifying the differences between the target and the reference series, complementing the statistical information about the correspondence between the**

different patterns analyzed. Finally, the normalized standard deviation allows completing the characterization of how a target series corresponds to the reference series. These statistical parameters are widely used in statistical analysis and they are linked to provide a very comprehensive evaluation of the results, allowing to evaluate the degree of correspondence between simulated and observed fields (Taylor et al., 2001). Thus, this diagram has been widely applied to analyze the performance of models in relation with the reality that pretends simulate (e.g., González-Cao et al., 2019; Wijayarathne and Coulibaly, 2020; Muñoz et al., 2022). This more complete description of Taylor diagrams was included in the new version of the manuscript.

González-Cao, J., García-Feal, O., Fernández-Nóvoa, D., Domínguez-Alonso, J. M., and Gómez-Gesteira, M.: Towards an automatic early warning system of flood hazards based on precipitation forecast: the case of the Miño River (NW Spain), *Nat. Hazard Earth Sys.*, 19, 2583-2595, <https://doi.org/10.5194/nhess-19-2583-2019>, 2019.

Muñoz, D. F., Abbaszadeh, P., Mofkharhi, H., Moradkhani, H.: Accounting for uncertainties in compound flood hazard assessment: The value of data assimilation, *Coast. Eng.*, 171, 104057, <https://doi.org/10.1016/j.coastaleng.2021.104057>, 2022.

Taylor, K. E.: Summarizing multiple aspects of model performance in a single diagram, *J. Geophys. Res.-Atmos.*, 106, 7183–7192, <https://doi.org/10.1029/2000JD900719>, 2001.

Wijayarathne, D. B., Coulibaly, P.: Identification of hydrological models for operational flood forecasting in St. John's, Newfoundland, Canada, *J. Hydrol. Regional Studies*, 27, 100646, <https://doi.org/10.1016/j.ejrh.2019.100646>, 2020.

- *Section 4: several parts in the discussion section should clearly be moved to the introduction or methods section because they refer to the conduct of experiments/simulation rather than the presentation and discussion of the results. Large parts thereof also contain various cited references which is typically something earlier in the manuscript. The mentioned parts are e.g.: 176-178, Section 4.2, Section 4.3 (incl subsections) until line 282; l 305-324.*

- **We agree with the reviewer in what concerns several of these suggestions. Thus, the information provided in lines 176-178 in the previous version of the manuscript has now been placed in “Data, Models and Methods” section (subsection “3.3 Digital Elevation Models”).**
- **The information presented in Section 4.3 in the previous version of the manuscript, including the equations related to dam operating strategies, has now been placed in “Data, Models and Methods” section.**
- **However, most of the information provided in Section 4.2 in the previous version of the manuscript has been maintained in “Results and Discussion” section. In this sense, we consider that this section provides important results because it presents the numerical reconstruction of the 1979 event, even validating more in depth the capability of the model to reproduce floods in lower Tagus by comparing with some information related to the event. The results obtained from simulation are continually compared and discussed with this related information. Therefore, we consider that if some of this**



information is transferred to other sections then, this section would lose clarity. Therefore, we consider that this information should be kept in this section to facilitate the reading and understanding. However, if the reviewer considers that some parts still need to be moved to other sections we will make the changes.

In summary, the authors consider that with the information transferred to other sections, as recommended by the reviewer, the new version of the manuscript presents a clearer structure.

- *L. 295ff: clearly state in the methods section that the proposed OS shall be applied to these five selected flood events*

**Done.**

- *L. 325-329: Here, the uncertainty associated to anticipate the expected volume for the coming days is mentioned. Why was this topic not addressed in an uncertainty analysis?*

This topic was not addressed because it would imply a complete hydrological procedure along all the years, including the respective atmospheric forecasts, which are not available for the entire period under scope. In addition, the uncertainty depends not only on the precipitation forecasts used, but also on the availability of in situ measurements, and the performance of the hydrological model applied, among others. To tackle in depth all these procedures would imply a complete separate study, being well outside the scope of the present study. However, it is important to mention that currently, new approaches based on the analysis and forecast of atmospheric structures that transport large amounts of moisture (such as atmospheric rivers), which are responsible for most extreme and large intense precipitation events provide additionally predictability potential for extreme precipitation, especially for the western Iberian Peninsula (Ramos et al., 2015; 2020). However, we agree with the reviewer that further analysis focused on the uncertainty associated to these issues should be developed in future works. This information, included the aforementioned caveats, was added in the new version of the manuscript.

Ramos, A. M., Trigo, R. M., Liberato, M. L. R., and Tome, R.: Daily precipitation extreme events in the Iberian Peninsula and its association with Atmospheric Rivers, *J. Hydrometeorol.*, 16, 579-597, <https://doi.org/10.1175/JHM-D-14-0103.1>, 2015.

Ramos, A. M., Sousa, P. M., Dutra, E., and Trigo, R. M.: Predictive skill for atmospheric rivers in the western Iberian Peninsula, *Nat. Hazards Earth Syst. Sci.*, 20, 877-888, <https://doi.org/10.5194/nhess-20-877-2020>, 2020.

- *L 370: maximum water velocity – if this is an important aspect, state this already in the methods or objectives section to highlight that it will be assessed in the article. Currently, it is hidden as a side note at the end of the results.*

**These important aspects to evaluate in floods, including the maximum water depth and the maximum water velocity, are now well commented in the methods section in the new version of the manuscript.**

- *Section 5: This is in large parts of a summary and no conclusion section. As mentioned above: a specific “Objectives” section might help here to motivate drawn conclusions, e.g. could the stated goals be met? Why, or why not? Are the routes for improvement?*

**Following the reviewer’s suggestion, we renamed this section as “Summary and Conclusions”. In addition, we rewrote this section and added information following reviewer’s comments (moreover, we also added a specific section: “Motivation”, as mentioned above).**

#### ***“6 Summary and Conclusions***

*This work aimed to present dam operating strategies that allow taking advantage of existing infrastructures in the Tagus river to effectively mitigate floods, that have occurred in its lower valley in recent decades, and may occur again in the future. For this, dam operating strategies were developed and, in combination with the Iber+ hydraulic model, the effectiveness of the proposal in relation to flood mitigation was analyzed.*

*Firstly, Iber+ model was validated for the area under scope. In this process, several DEMs were used to determine the best one to macroscopically reproduce the floods in the lower Tagus valley. Copernicus DEM shows the best accuracy. In fact, Iber+ model coupled with Copernicus DEM was able to provide an adequate macroscopic reproduction of the most important flood of the last 150 years in the Tagus valley, the 1979 flood, which demonstrates its capability to evaluate floods in the area under study and allows the hydrodynamic analysis of this event. This also provides useful information of accurate tools that could serve as a basis to future studies addressing other different aspects related to flooding in lower Tagus valley.*

*Once the Iber+ model was validated, the analysis was focused on developing dam operating strategies to help in flood mitigation. Specifically, the analysis was focused on Alcántara dam, the most important on the Tagus river. In general terms, results indicate that the first proposed strategy (OS1) allows diminishing the number of days under flood conditions by about 80 % with respect to the natural regime, and an important reduction is also obtained in relation to the historical dam operation. In addition, the mitigation of the most extreme flood events was also achieved. Hydraulic simulations confirm that the proposed operating strategy focused on the mitigation of extreme events (OS2) is especially effective in reducing water depth and water velocity in the flooded areas (~ 25-30 %), the most critical factors in terms of flood*

damage. In addition, a smaller reduction in flood extension is also achieved (~ 5-10 %). Therefore, hydraulic simulations corroborate the significant flood mitigation in the lower Tagus valley that can be achieved with more appropriate use of dam strategies, as proposed in this work. This demonstrates the effectiveness of the strategies proposed to address the future implications of climate change in relation to the expected more frequent and intense flood events in the future. This manuscript and mitigation strategies OS1 and OS2 represent an example of a set of strategies that will allow the mitigation of floods taking advantage of the existing infrastructures, and that can serve as example of application to other basins.

In summary, this study can be viewed as a first step to improve the knowledge on extreme floods in the lower Tagus valley and to provide strategies to mitigate these events taking advantage of the existing infrastructures, thus addressing one of the most important challenges that the scientific community will have to face in the coming decades as a consequence of climate change. Future improvements should be focused, on the one hand, on the development of similar strategies applied to other important dams throughout the Tagus basin, both in the Spanish and Portuguese sections, providing a cascading interconnection between the different dams and the operation strategies developed, which will improve and make more effective the flood mitigation provided by these infrastructures. On the other hand, future improvements should also consider the integration of the dam operating strategies for real-time early warning systems. These strategies, in combination with the hydraulic models and good weather forecasts, will allow evaluating in advance the likelihood of flood scenarios and apply the right measures that minimize the floods (Chang et al., 2010; Chou and Wu, 2015; Fakhruddin et al., 2015; Fraga et al., 2020). This will also allow to improve and make more precise the dam strategies applied. As commented above, a future improvement and development of high resolution DEMs for the area under scope will be also necessary to enable more detailed analysis of flooding within the villages which will allow to the local authorities to take adequate and more precise measures to mitigate flood damage.”

- *L. 398-405: Acknowledging caveats is an important scientific discussion but should be part of the “results and discussing” section and not of the “conclusions.”*

**We agree with the reviewer. In the revised manuscript this information was placed in previous sections.**

- *L 415: In the early part of the manuscript, it was mentioned that bad communication between Portuguese and Spanish authorities exacerbated the flood impacts in 1979. Did the EU help here or is there improved bilateral operation? Please elaborate.*

**In the 1979 flood event there was a lack of communication between the different authorities that controlled the different dams, coupled with poor dam operations. This provoked that when flow peaks arrived, dams controlling Tagus flow were virtually full therefore hampering the capacity to exert sufficient control on the peak river flow. Both Portugal and Spain were not part of the EU in 1979 as both countries would enter only in 1986. Currently, a bilateral protocol is established to**

**improve the management of dams (Albufeira agreement, in 2000). In the new version of the manuscript we clarified these issues.**

Escartín, C.M.: The Agreement between Spain and Portugal for the Sustainable Development of the Shared River Basins. International Conference of Basin Organizations, Madrid, Spain, 4-6 November, 2002.

### ***Tables and Figures***

- *Table 2: Specify caption, e.g. which peak flow – the incoming flood wave?*

**Done (see new caption of Table 2):**

“**Table 2.** Hydrologic characteristic of most extreme flood events under different dam configurations. NR is referred to the natural regime (no dam), OS1 is referred to the operation strategy presented in equation (4), and OS2 is referred to the operation strategy focused on extreme events, presented in equation (5). Flood days are referred to the number of days exceeding the flood threshold during each considered event. Peak flow refers to the real maximum daily inflow in the case of the natural regime, whereas it is referred to the maximum daily outflow from the dam under the different operation strategies applied. Percentages are referred to the differences with respect to the worst scenario (natural regime), which is assigned a percentage of 100 %.”

- *Table 2: add percentage reductions as was done in Table 3*

**Done.**

- *Table 3: very nice overview with absolute and relative reductions!*

**Thanks.**

- *Figure 2 caption: please add “, respectively” to the end of the sentence*

**Done.**

- *Figure 6: please add x-axis tick labels, i.e. numbers. And specify number of day since when?*

**Done.**

### ***Language***

- *Overall, the manuscript is well-written. Please read over it again to e.g. fill in missing articles (l. 20: [the] Iber+ model; l. 32: [The] Iberian Peninsula; ...) or to rephrase very long sentences (e.g. l. 336-339)*

**A review of the writing of the entire manuscript was done following reviewer' suggestion.**

- *Some rewording suggestions: l. 32: "important" à "intense"; l.49-50: "that can play an important rule in" à "for"; l. 159 "free" à "freely"*

**Done.**

### ***References***

- *Complete*

**Thanks.**