Dear Editor,

Thank you for your continued efforts in ensuring our manuscript receives reviews—we appreciate your time and understand the challenges of finding reviewers.

Please find our responses to the reviewers below. For clarity, the line numbers refer to the version of the submitted PDF **with** tracked changes.

Dear Reviewer 1,

Thank you for your time in reviewing our manuscript. We hope that our responses resolve the outstanding issues:

1. We have re-emphasized the optimization method in the manuscript:

   "Specifically, we optimize (using a sampling approach) the operation rules of 30 reservoirs in southwest Germany…" (lines 91-92)

   "The forecast operation models were optimized by testing 1,000 different parameter sets consisting of combinations of 10 values each of Q_r, percQ_thresh, and percQ_release, and looking for the highest-benefit parameters that did not increase flooding conditions." (lines 225-227)

2. We have added a brief introduction to FIRO and reframed some of our introduction with this in mind:

   "The role of forecasts in reservoir operation and optimization has been an active topic. As the quality of streamflow forecasts improve, more studies are investigating the increased utility of forecast-informed reservoir operations (FIRO), generally taking the form of prerelease operations in flood reservoirs (Timberlake et al., 2025). FIRO, and indeed reservoir operations in general, have often relied on the concept of hedging—in other words, the idea that an increase in short-term risks, e.g. by continuing to keep water storage despite incoming floods, can increase long-term benefits by increasing water supply in times of deficit (Zhao et al., 2014; Draper and Lund, 2004; Hui et al., 2016). Many studies report that reservoir operations benefit from (or at the very least, are not negatively affected by) FIRO in comparison to the case where no future information is available (Delaney et al., 2020; Chen et al., 2016; Mostaghimzadeh et al., 2022; Schwanenberg et al., 2015)." (lines 69-77)

   "These results, however, are primarily in the context of large reservoirs; a recent review of FIRO indicates that more research on the influence of reservoir characteristics will improve forecast assimilation into operations (Timberlake et al., 2025). Given the potential benefits of small repurposed flood reservoirs for drought resilience under perfect knowledge, the value of forecasts in the operation of a variety of these reservoirs should be investigated." (lines 85-88)

3. We have clarified this in the caption for Table 1:

"The categories are a combination of first the reservoir's DIN 19700 size category (L = large, M = mid-size, S = small) and the current operation (F = flood-only, M = multipurpose)." (lines 128-129)

4. We have extended our discussion of the appendix figures:

   "These rules are similar to the in-situ operation rules (store only flood waves and release volume as soon as possible) and are therefore most likely to result in no increased flood penalty. However, because these operation rules do not hold water for very long, they are less likely to provide any benefit (see Appendix **Error! Reference source not found.** for a heat map of average benefit for each parameter combination)." (lines 332-335)

   "This is also reflected in heatmaps of average benefit for parameter combinations (see Appendix **Error! Reference source not found.**), where combinations that increase the amount of water stored (higher percQ_crit) and that allow water to be stored for longer (higher percQ_thresh) result in higher benefits." (lines 338-340)

Dear Reviewer 2,

Thank you for your comments. In our revision, we relied less on references to the two previous papers and instead elaborated more on the technical aspects of the methods section. In the interest of space, we list here a selection of additions:

- **A brief explanation of the selected reservoirs**
  "Reservoirs of various sizes, inundation types (operational indicating inundation only when a flood event occurs, permanent meaning there is always water impounded), and current usages (only for floods, or additionally with other purposes such as recreation or nature protection) were selected to investigate the potential impacts of reservoir characteristics on performance." (lines 117-120)
- **An expansion of the calculation of AID**
  "Time series of irrigation demand for each reservoir were , calculated for a 5 km^2 square-shaped region around each reservoir using the methodology of Ho et al. (2026). Crop cover and soil texture maps were obtained from Schwieder et al. (2024) and Düwel et al. (2007), respectively, and used to identify agricultural response units (ARUs)—areas of the same crop and soil cover within a region. The irrigation demand (AID) of each ARU was calculated using the FAO-56 dual crop coefficient method (Allen et al., 1998) using a collection of plant growth and soil parameters from various sources, shown in **Error! Reference source not found.** (Allen et al., 1998; Pereira et al., 2021a; Pereira et al., 2021b; Rallo et al., 2021; Ad-Hoc-Arbeitsgruppe, 2005). In order to estimate the AID needed to avoid water stress in the crops, the FAO-56 dual crop coefficient method calculates the daily actual evapotranspiration for a given crop (ET_c) over a unit area…" (lines 173-199)
- **Details on the perfect knowledge scenarios**
  "The forecast model benefits for each reservoir are evaluated in comparison to its perfect knowledge scenarios to determine the impact of forecasts in operation. The perfect knowledge scenario in this study refers to an operational scenario where the exact onset of flood events is known, but not the magnitude. The reservoirs are thus emptied by releasing the water in the reservoir at a rate such that the downstream discharge is Q_{crit}, and timed

such that the reservoir is completely empty one hour before flood onset. Because the downstream discharge does not exceed Q_{crit}, the river does not experience any increases in flooding conditions. Water then is taken or released from the reservoirs when needed without attempts to ration for the future, and the benefits of the perfect knowledge operations are calculated according to the methods in section **Error! Reference source not found.**." (lines 294-304)

- **Additional context on the penalty benefit**
  "Streamflow penalty (P_d) is a dimensionless unit that increases as the outgoing streamflow at each timestep ($Q_{out,t}$) decreases below the streamflow demand for that timestep ($Q_{70,t}$)…" (lines 242-244)

As for the minor comments, we have updated as follows:

- We have left the title as is but have edited all instances of "re-purposed" into "repurposed".
- We have added a size estimate:

  "In this study, we investigated potential operating rules under forecasts for 30 small-to-midsize (less than 5 million m^3) flood reservoirs…" (lines 16-17)

- We have removed the word "otherwise" for clarity.
- We have edited for conciseness:

  "They can also be much more easily adapted to local conditions (Venot and Krishnan, 2011)." (lines 52-53)

- We have added context to the flood penalty:

  "This scalar was intended to generally represent the damages of floods scaling with excess volume; however, absent any true damage functions, we have arbitrarily chosen 5 as the value here." (lines 234-236)

- We have added a small circle icon to the figure as suggested.
- We have added the context:

  "The number and performance of resulting viable parameter sets (those that did not increase flood conditions) varied greatly, with some reservoirs having no viable parameter sets and others having more than 900 (**Error! Reference source not found.**). Each viable set is represented as a point expressing the benefit; more densely populated regions mean multiple parameter sets resulted in similar benefit values. Almost all reservoirs had a broad range of benefits from their viable parameter sets, though the small multipurpose reservoirs had very little benefit. This, however, is an expected result, as previous studies have already shown these were generally not suited for this purpose (Ho et al., 2026; Ho and Ehret, 2025)." (lines 307-312)