Dear Editor,

Flood simulation with the RiverCure approach: The open dataset of the Águeda 2016 flood event

By

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The paper presents a WEB GIS platform "RiverCure", that is designed to manage data and to simulate floods using an in house developed code HiSTAV. The data set that is proposed for the Agueda 2016 flood event, it includes all the input data and the output data.

General Comments

Unfortunately, this paper possesses an in review paper in preprint (https://www.preprints.org/manuscript/202305.1472/v1), which includes a lot of information that is missing in the present manuscript, but it is not cited at least in review. In addition, more than half of the figures are very similar.

Authors: We appreciate the valuable comments provided by the reviewer that we will fully address. The reviewer points to a paper that is effectively in review now. It has been in review since 19th May 2023, 60 days after the the submission of the present paper and its dataset. It is important to note that the paper mentioned focuses on a different aspect, complementing our work. In this publication, our primary objective is to present a unique and highly relevant dataset that can serve as a well-documented and reliable validation resource for modellers. On the other hand, the other paper primarily focuses on the key design aspects of the RiverCure Portal (RCP). Given the opportunity, we will further emphasize the significance of our proposed dataset while reducing the description of the RCP by referencing other relevant publications.

Since the data are based on a poor quality DEM, I do not see the interest in sharing the data and the results, since a lot of issues must be linked to this modelling, some of the data is already in free access it seems. Furthermore, not enough information is provided to assess the quality of the data set and results especially when this argument is given: "The Águeda 2016 flood event was reported mainly on the Portuguese media allowing them to know reasonably well the limits of the flooded areas." The Web-GIS platform seems a very nice contribution, but unfortunately the dataset is not well described and poorly convincing. In addition, since the platform seems efficient, new data based on high-resolution DEM and better described hydraulic parameters, would be of larger interest and with new fast computer it is a nonsense to provide data that results of computation, since models are evolving.

Authors: We accept that we did not elaborate enough on the significance of the proposed dataset. We are confident that this dataset is indeed relevant, and we are willing to improve the manuscript in this key aspect.

It is true that the flooded area has been documented in the media and is well-known, at least in Águeda downtown. What is not known is why Águeda has been flooded, because the river level never exceeded the protection walls.

To be clear, modellers using a DTM other than this would not be able to reproduce the flood, unless they tweak resistance coefficients to wrong values.

This manuscript addresses and solves this issue – the vulnerability in the river walls was detected through field work and included in this DTM.

The results of the hydrodynamic model are not included to showcase its performance. They are needed to reconstruct velocities and, knowing the channel geometry, discharges at Águeda bridge and along Águeda waterfront.

We emphasise that flooding is a recurrent problem of Águeda city. There are no curated dataset that allows for the correct description of its flooding events. The dataset we are proposing includes hydrometric, udometric and numerically-produced data from a calibrated model and thus constitutes a relevant and complete validation test for other flood models and a tool to better mitigate floods in this river and in similar rivers.

Per se, none of the data sets (hydrometric, udometric or numerically-produced) would be sufficient. It is the synthesis that matters and explaining it is the driver of this paper.

We insist that the numerically-produced data is a closure – we know the maximum flow depth (from the media and official communications) and the boundary conditions but we do not know the discharge at Águeda bridge because the hydrometric station was malfunctioning during the event. The discharge at Águeda bridge had to be estimated with the hydrodynamic model. This task required a time-consuming assemblage of topo-bathymetric data and calibration procedure. Since the city was flooded not because of the protection walls overtopping but because of vulnerabilities in these walls, these had to be investigated by us to be incorporated in the DEM. Thus, the DEM was based on the global ASTER-DEM but a relatively demanding work was carried out to obtain the final DEM included in the dataset to ensure an adequate resolution for the river bathymetry and local vulnerabilities. This involved collecting and updating data regarding the elevation of the protective walls of the riverfront of Águeda city and reproducing the geometry of the under-passages of Águeda bridge. Extra details will be updated on the dataset with the revised version of the manuscript.

Specific comments

Line 26: here systemic vulnerability will be a better word.

Authors: We will change accordingly. Thank you for the suggestion.

Figure 2 does not include enough details since it is linked to the data.

Authors: Figure 2 refers to RCP structure therefore we may remove it in the revised version and refer to the dedicated publication.

Line 92: please give the full definition name of CFL I guess: Courant–Friedrichs–Lewy

Authors: Thank you for spotting the no identified abbreviation. Indeed, CFL stands for Courant-Friedrichs-Lewy, a conventional condition to restrict the computational time step. We will include the full name on the revised version.

Figure 4: improve please.

Authors: We will improve the image quality, the colour scale and the legend.

Line 197: sampled hydrograph is confusing when used for modelling, what about ground truth?

Authors: By sampled hydrograph we meant the hydrograph obtained by modelled data. We will improve the writing style to make it clear. There was a gauge station within the modelled domain, at Águeda Bridge, however it has been malfunctioning for few year, including during the flood event. Therefore, there is no measured data available for comparing hydrographs. In our opinion, this particularity strengthens the relevance of the presented dataset, that includes a synthesis of hydrometric, udometric and numerically-produced data from a calibrated model.