Dear dr. Schumann,

Many thanks for your swift review on the manuscript. We also want to express our thankfulness for the kind words on the submitted article, for raising your concerns about shortcomings of the current version of the manuscript, and for providing constructive criticism how to further improve the work.

Hereafter, we address your remarks made in the review document per point and outline how we will adapt the manuscript to account for all concerns raised. Thereby we first refer to your original comments in black and subsequently provide our response in blue.

Title: Not sure what the word “nested” here implies, please consider removing it. The models are placed not inside each other. Rather they are used within a framework as a one-way coupling.
Many thanks for outlining this ambiguity. From the perspective of model code, it is indeed correct that the models (i.e. model codes) are not placed inside each other but remain individual entities coupled by means of a framework. However, this is not what we are referring to in the title. Since we employ models with different spatial extent, for example one for the entire basin and one for only the delta area, the models are “geographically” placed inside each other and hence nested. As providing this explanation in the title would make it too lengthy we will stick with “nested” in the title but will ensure that it’s clearly formulated in the main text.

Abstract: Please only use “are”in the first sentence, three tenses are confusing.
Thank you for this remark. We will reduce the number of tenses to one to make the sentence better digestible and comprehensive.

Abstract: The word “physicality” I think is wrong here. Maybe say increase the physics
Thanks for the comment. After carefully re-reading the abstract we concur with you and will rephrase the sentence accordingly.

Introduction: This is an account of GLOFRIM. It would be useful to also give a bit of background literature on other attempts to include floodplain representation in global hydrologic models for instance.
We thank you for this thoughtful comment. In fact GLOFRIM is not so much designed to include floodplain representation in global hydrologic models, but to facilitate model coupling in general. Nevertheless, we see the added value of extending the discussion on other approaches trying to include floodplain representation in global hydrologic models or similar model (component) integration approaches. Thus, we will increase the literature review on this topic in the revised manuscript.

Methods: All three main models are described rather very briefly. More detail is needed here to outline the physics somewhat more clearly. Also, why not use CaMaFlood as a 2D floodplain model – it has a subgrid floodplain representation with simplified local inertia included? What is the added value of LISFLOOD-FP and why use CMF only as a 1D routing here? This needs to be better explained.
We appreciate this critical comment on model description and choice. Regarding the former, we will carefully re-assess the manuscript as well as the supplement. Where needed, we will extend the model description. As we aim to keep the model description in the actual manuscript as brief as possible, most of the extension will most likely be in the supplement; yet, the current version of the manuscript may be extended as well to ensure the minimum required to follow and comprehend the presented test cases.
Regarding the CaMa-Flood model, floodplain inundation depths at a high resolution are the result of statically downscaled flood volumes contained in the 1D floodplain storage and not the result of 2D dynamical computations (see the model manual here: http://hydro.iis.u-tokyo.ac.jp/~yamadai/cama-flood/Manual_CaMa-Flood_v362.pdf). This is very different to LISFLOOD-FP which dynamically computes inundation depths on a high resolution throughout the floodplain based on the local inertial equations. In that sense, we consider

CaMa-Flood and LISFLOOD-FP to be different categories of models as also shown in the manuscript.
We concur that this categorization and hence also the way how models were applied can be explained better. In the revised manuscript, we will add the required information.

Coupling realizations. This may be outside the scope of this paper but the real benefit of any coupling is that the models can communicate in a two-way feedback, in other words, one should ideally be able to use the computed (error) in inundation to adjust or correct inflow to the hydrologic model. I think realizations here are only one-way coupling and this needs to be made clearer. The strength of the GLOFRIM framework is dynamic coupling (but one way) within a plug 'n play model builder.
Many thanks for the great comment on model coupling and its benefits. We agree that model coupling, especially online coupling, is most useful if applied for two-way coupling as it becomes possible to study the dynamic interactions between various physical processes. Even though current work is ongoing (see eg. AGU 2018 abstract on including MODFLOW https://agu.confex.com/agu/fm18/meetingapp.cgi/Paper/389133https://agu.confex.com/agu/fm18/meetingapp.cgi/Paper/389133), this was not yet applied for this manuscript. To be able to make use of the benefits of two-way coupling, we designed GLOFRIM with online coupling already although it would technically not be needed to combine the models used here. For the revised manuscript, we will point out more explicitly the reasoning and benefits for opting for one-way coupling as well as the shortcomings compared to two-way coupling. That way possible ambiguity will be avoided.

Model validation: Validation values NSE and hit rate, and CSI are quite low. An explanation of these relatively low values should be included.
Thanks for the great comment concerning the results of model validation.

- The NSE is only low for the PCR run, not for PCR-CMF. This is due to the kinematic wave equation which lacks the physical reality required to properly estimate flood wave propagation. Besides, the simplicity of the approximation together with the LDD and raster-based routing scheme of PCR produce strong daily variations in discharge (see plot) which yield low NSE values. The updated manuscript will extend the discussion of those results.
- The hit rate is low for PCR and PCR-CMF due to their static downscaling approach which limits simulated inundation extent to areas directly adjacent to (main) rivers mostly. Smaller inundations in areas where for instance backwater effects of 2D floodplains are dominant, cannot be simulated correctly. Besides, the Ganges-Brahmaputra-Meghna delta is well known for its large amount of small river reaches and consequent flow divergence. While PCR cannot account for river bifurcations at all, CMF could potentially but we did choose not to activate this option to maintain a certain common standard between models. This altogether results then in a low hit rate. The revised manuscript will contain this important discussion.
- Similarly, the CSI is low, partially due to the same line of reasoning. Is is furthermore worth mentioning that we did not perform any calibration of the models with respect to inundation extent. We decided to desist from calibration to not make the calibration technique and data dominant over the actual model set-up and conceptualization. This may not have become clear in the current manuscript and thus a more elaborated explanation of modelling choices will be added to the revision.

Discussion/Conclusion: Again, here the limitations of one-way coupling should be more discussed.
Following from your previous comment, the updated version of the manuscript will include a more elaborate discussion about the one-way coupling approach employed in this study.

At Fig. 5, I believe the model simulation with LFP is missing. Please check.
We thank you for spotting this error. Since this figure represents the validation of simulated discharge outside of PCR and CMF for a point outside the LFP domain, it is not the plot that is wrong but the caption. In the updated version of the manuscript we will rectify this error and ensure figure and caption match.