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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Effectiveness of low impact development for urban inundation risk mitigation under different scenarios: a case study in Shenzhen, China" *by* Jiansheng Wu et al.

Anonymous Referee #1

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General comments This study sought to evaluate the impacts of LID practices on urban inundation at a watershed scale in China. Extensive modeling was used to assessed various LID implementation scenarios with a hydrodynamic inundation model, which coupled SWMM and IFMS Urban models. The study is interesting and will contribute to the understanding of LID effectiveness related to flood reduction. However, the scientific quality and presentation quality were poor. First, English in this paper is poor. some contents are difficult to understand. I would strongly recommend the editing by an experienced or even better native English speaker. Next there some major and obvious weakness in methodology and results. I listed them below. Also, it requires lots of improvements in other sections.

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Discussion paper

Introduction: Review should be correct. In page 3 line 16, "we find that few researches use hydrodynamic models, like SWMM ...". In fact, there are many studies of SWMM in LID field, especially in 2017 in China. Also, the introduction is very universal, does not clearly lead to the specific content of the manuscript and is missing a central theme. For readers to quickly catch your contribution, it would be better to highlight major difficulties and challenges, and your original achievements to overcome them in a clearer way.

Materials and methodology:

1) Why you selected these two events? Were they have special characteristicsïij§

2) How you downscaled the dem resolution? The bias from downscaling was corrected?

3) land use area should be described as well as the implementation area of each LID scenario

3) Is there discharge Data for SWMM calibration?

4) Why you coupled SWMM and IFMS Urban models? What the advantages compared with others? This study discussed inundation depth, area and time. There three indices could be got from some 2D inundation model. As I know, the outputs of SWMM are outflow, peak flow, flood volume, etc. This study didn't mention any of them. So, why you need SWMM?

Results:

1) The results for hazard level seem very sensitive to the thresholds chosen. Please give information on the thresholds chosen.

2) Results are contradicted. The authors reported on Page 7 line 11-12 "the reduction effects become more evident as hazard level increases", "the roles of LID practices with respect to urban inundation mitigation are less obvious at High levels than those

at Low levels". So which one is correct?

3) please show the spatial distribution of reductions in inundation depths instead of average reduction

4) please give more information of PP and GR implementation area, otherwise, you cannot say PP performs better than GR

5) in section 3.3 you said the reduction in inundation area under High level was more obvious, but in section 3.1, reduction in inundation depth was less obvious. Please explain.

6) please show the spatial distribution of reductions in inundation time instead of average

7) one of the key points in your study is to compare the differences of all scenarios at three hazard levels not to find the differences among three hazard levels.

Discussion: 1) The discussion is lacking depths. What are the same and different points comparing your study and others? What you studied from this research.

2) The discussion on cost-effectiveness completely fell from the sky on page 9 line 3. You neither present how the costs were estimated nor discussed them in the Results.

3) In page 9 line 22, "we also find that spatial distribution of landscape patterns ...". This information completely fell from the sky. You neither present them in the Results.

4) You reported 25% of PP and GR had the highest efficiency. Is it correct? Do you consider the effect of rainfall intensity and frequency? LID effectiveness is highly related to rainfall intensity and frequency.

Specific comments

1) Page (P) 1 line (L) 15-19, too long to understand

2) P1L25, considering cost-effectiveness, you don't give any information on it.

3) P2L4: what are secondary disasters? it is better to delete

4) P3L18-20, there some studies on this topic, please review them

5) P3L29, give rainfall information from April to September

6) P4L5-10. simplify the description

7) P4L12, delete"needed for modeling"

8) P4L18-19, how to do

9) P4L20-22, improve

10) P5L1-3, improve

11) give clear information on the model

12) P5L31-32, "we found ..."???

13) P6L3, strength? is it density?

14) P6L19, relative error 30% is acceptable?

15) P6L24-25, give more literature to support

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