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**Hydrology and Earth System Sciences Discussions**

# *Interactive comment on* "Reconstructing the tropical storm Ketsana flood event in Marikina River, Philippines" *by* C. C. Abon et al.

**Anonymous Referee #2**

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Major comments:

Introduction The introduction doesn't flow well: at present the argument is structured as follows: "1) There was a large event that resulted in unprecedented flooding; 2) This is the Marikina River Basin; 3) Here is the climate of the Manila Region, 4) Flood warning systems are missing".

Can you restructure this to make a clearer argument, and in particular to motivate particular questions or hypotheses for this study?

For instance: 1) There was a large event that resulted in major flooding 2) A major factor in the destructiveness of the flood was the lack of a warning system 3) Here are



the things we would need to do to generate such a warning system, and here is how we can learn from the TS Ketsana experience.

You could then move details of the basins and climates to the Methods under a new heading such as: "Basin Characteristics" or similar.

Regardless of the decisions the authors make about the structure of the Introduction, the specific tasks and questions that they are attempting to answer by undertaking this research need to be clearly elucidated for the reader – at present the introduction is too open ended and doesn't sufficiently motivate the specific research tasks.

Methodologies The survey used to determine people's ideas about the flooding is a novel methodology and needs to be linked to literature about similar methods. I am not familiar with the use of such interview techniques for flood reconstruction elsewhere, but similar participant-centred research approaches are used in many contexts and the authors should attempt to contextualize their method by reference to such literature. This would also give a sense of whether 5 respondents per station is enough to give robust information.

Basin and sub-basin delineation The vast majority of this section is highly redundant. HESS readers are aware of DEMs and their importance to hydrological modeling. Rather than providing 2 paragraphs of background, please provide more detail on how you processed the STRM data to generate the basin boundaries. What uncertainties or errors might remain? Do these data conform to ground truthed situations (or even local knowledge of where the watershed divides are likely to be?). What were the "necessary adjustments" to the basins performed in ArcView that were not sufficiently clear from the ILWIS processing? What are the implications of any errors made in this step for the simulations made down the track?

HEC-HMS Again, don't include unnecessary background. For instance, given that you chose to use the SCS-CN loss method, why bother listing all the other potential loss methods you did not choose to use? Instead it would be better to defend this choice of

loss method (presumably including the lack of soil data for the watersheds that could be used for a more mechanistic treatment of runoff generation)? You should however specify that the chosen curve number is determined by the land use, so that the link into the final paragraph in this section is clearer.

Interviews and Field work I would be cautious about saying that the consistency between interviewed subjects "proves" anything – everyone could be systematically making the same error for instance! Tone down the language.

Given the differences in the timing of the flood peak did you attempt to assess the velocity of the flood wave? Or were there multiple flood waves?

What were the features of sites where high flood stages were reported from interview?

HEC-HMS model results

What other sources of floodwater are there that could have generated the discrepancies you saw? Can you determine to what extent the downstream errors are associated with these other water sources versus back-water effects due to floodplain characteristics?

Flood mapping Given the model for the basin and the aims of the study, I would really like to see one additional element in this study: namely a synthetic approach that could be used to determine levels of flood risk in space and time. If, for instance, you forced your model with rainfall corresponding to the 1 year, 2 year, 5 year, 10 year, 50 year and 100 year storms, what sorts of predictions could you make about peak discharge, peak flood stage, which areas in the floodplain would become inundated, and how long you would have to employ warning systems? Including this final piece of the study would move from analyzing one event to developing a preliminary indication of high risk areas for flooding, and the potential frequency at which such flooding might occur. Surely this would be extremely useful for future disaster relief and planning in the Manila metropolitan area?



Minor comments:

This paper, while generally well written, needs to be edited carefully by a native English speaker. There are several areas where the language and grammar are not correct or appropriate for an international journal. I've identified a few such examples below, but I ran out of energy for making these changes.

Abstract:

Line 1 and throughout the paper – is "Metro Manila" the local term for the Manila urban area? Or is this an abbreviation for metropolitan Manila? If the latter, please use the more formal language throughout the paper.

Line 7-9: The logic of this sentence does not make sense – consider restructuring it (it does not follow that the presence of anthropogenic factors should have prevented the models from being able to reproduce the flood characteristics – I would separate these ideas)

The study revealed that while there were anthropogenic factors that exacerbated flooding in Marikina, the observed flood heights can be simulated in the models generated.

Introduction:

Line 19: unit consistency – are you reporting depths (mm) or intensities (mm/day)? Either way keep it consistent between all storms you describe (an intensity of 371 mm/day might not be very important if the storm lasts only 2 minutes!)

Line 20: Informal and awkward wording, consider revising The volume of rainfall resulted in a flood that was exceptionally high and extensive which made it extremely devastating.

Line 25: Is the Marikina Basin located within Metro Manila; or is Metro Manila located within the MRB?

Figure 1 – as a general comment, most of the readership of HESS will not be familiar

with the geography of the Manila area – you may want to show a location map that firmly relates the study area to the rest of the Philippines, and shows the basin outlines of interest. The resolution of the figure provided here is not good, so I apologize if this is what the Figure currently does.

Methodology

Lines 18-19: “were inquired”... poor grammar. Consider rephrasing, something like: “Respondants were asked to estimate the time the flood peaked, the maximum flood height and the rate at which water depth was increasing”.

Basin and sub-basin delineation Line 4: “The availability and globally available DEMs” – poor language, revise

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 6081, 2010.