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.

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In general, this paper provides a commendable application of a DEM derived from SRTM data, GIS (ILWIS and Arcview), and hydrological modeling (HEC-HMS) to simulate flood flow in the Marinkina River near Manila, Philippines. Especially interesting is the use of local resident interviews to establish the time of peak flooding and the various maximum flood heights achieved along the Marinkina River for the 26 September 2009 flood. For a rainfall data input derived from a station to the southwest of the study area, the hydrologic model simulates the 26 September flood flow hydrographs

for the various interview stations (Figure. 5). The match of the flood peak arrival times predicted by the model (Figure 5) to those reported for the 6 interview stations along the river (Figure 2 in the current version of the paper) might be considered to be a kind of model validation, though the authors do not make this claim as such. The type of procedure outlined in the paper could well have flood hazard and flood warning applications in other regions these needs are challenged by limited available hydrological information.

The study could have been improved by a program of making direct field estimates of the peak discharges achieved for the 6 stations where maximum flood heights were recorded from the local interviews and field surveys. While technically feasible using hydraulic software, such as HEC-2, there may have been complexities in the local field sites in regard to generating the cross-sectional data necessary for input to the models. In any case, while such new work is beyond the scope of this paper, this issue can at least be pointed out in the paper.

There are also many limitations on the study that could have received more attention. For example, while the model runs did seem to simulate the observations (Figures 5 and 2), it is not clear that this was achieved by use of input parameters that exactly matched the real world The input data came from one meteorological station, and that station was not even in the basin. Could the real rainfall intensities have varied considerably over the area of the basin (as would be expected in an area of variable relief experiencing a moving tropic storm)? Obviously, one has to use the available input data, but my point is that this issue needs more discussion in the paper. Stated another way, the data (flood peak heights and arrival times) served to test the fit of the model runs, but they did not really test the model against reality, since the such a test must include not just comparisons of model outputs to reality, but also comparisons of model inputs and assumptions to reality. Once again, this is a discussion point that could be added to the present paper.

It is stated on page 6088, lines 25-26, that the modeled flood peaks on the Marink-

ina River are, "...the highest for a 42-year record (1958-2000) of the country." This statement is ambiguous. Is this the highest for any gauged basin in the country, or is it highest for a basin of this drainage area, or is it highest for the Marinkina basin? It would appear to be the latter, in that a 100-year flood peak of 3440 cms is stated in lines 26-27. However, if this is the case, then the 42-year record of flows on the Marinkina should be provided in this paper, or at least summarized so that the reader can compare it to the 26 September 2009 event.

There are a number of more minor, technical and editorial points that mar the overall presentation of the paper. These include the following (though these should be considered examples, since I was not able to go over all such points in detail):

Line 8 of the abstract (page 6082) refers to "anthropogenic factors that exacerbated flooding." However, I was not able to find any information about this fact in the body of the paper. (The abstract should not contain any information that is not already in the body of the paper.) Lines 8-9 claim, "...the observed flood heights can be simulated in the models generated." The word "generated" is not needed, but a more substantive point is that the model results (Figure 5) simulate discharges, not the observed flood heights.

The abstract should point out that post-event resident interviews were used to establish that the peak flood flows occurred at different hours along the river (lines 9-10), since this is an important innovation in this study.

The sentence in lines 18-19 of page 6083 needs to be rewritten as follows, "The residents were asked to report the time of the flood peak, as well as the estimated maximum height and rate of flood water increase."

The first reference to Figure 3 is made at the bottom of page 6083, but the first reference to Figure 2 is not made until page 6087. This problem for figure placement can be corrected by reversing the numbering of the current Figures 2 and 3.

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The paper does not properly cite references by 2 authors. Instead, all papers by more than one author are listed as "et al." This should only be done when there are 3 or more authors. Thus references to Liu et al. (page 6084 line 18), Usul et al. (page 6084 line 20), Zenger et al. (page 6084 line 20), Chubey et al. (page 6084 line 21), Ludwig et al. (page 6084 line 24), should be, respectively, Liu and De Smedt, Usul and Burak, Zenger and Waalands, Chubey and Hathout, Lugdwig and Schneider.

Page 6086, lines 3-4 refer to (Singh, 1994), but this reference is not listed on page 6091.