

Interactive comment on “Assessing the influence of an extended hurricane season on inland flooding potential in the Southeast United States” by Monica H. Stone and Sagy Cohen

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We thank the reviewer for the insightful comments. We have addressed all of them in the revised manuscript. Below we provide a point-by-point response.

"The premise of this study is simple, yet in its simplicity it answers a fundamental and important question. The methodology is well written and easy to understand, which allows the reader to fully engage and understand the reasoning on how and why this important science question posed can be answered."

Thank you.

"Yet, there are a few minor tweaks that could really help this paper. Like the first re-

C1

viewer, I think the writing could be more succinct, especially in the introduction section. For example, paragraphs 5 and 6 in this section could be merged to avoid some repeating. More details can be found in the marked up pdf."

The changes suggested in the marked up pdf were made. Please see the revised manuscript.

"I would like to see further justification for the selection of the study sites and/or examples of flood events and their characteristics. For example, when was the last large flood in each basin and was it associated with a tropical cyclone? This will particularly help the reader not familiar with the basins in question. This could be in a simple table to aid readability."

The following explanation was added in the first paragraph of the "Study Areas" section:

This research is focused in the south-eastern United States, where tropical cyclone events occur quite frequently, and where severe flooding following these events can have profound impacts on the prosperity of communities. Specifically, four river basins (Neches, Pearl, Mobile, and Roanoke) were selected for analysis (Fig. 1; Table 1). These four basins were chosen to be in areas that experience tropical cyclones, and a high number of severe hurricanes. Currently, tropical cyclones impacting these four basins rarely cause flooding. As is shown later in this paper, this is primarily due to the overlap of the current hurricane season with the low discharge seasons on these four rivers. However, an extension of the hurricane season, such that it encroaches upon the high discharge seasons on these rivers, could likely lead to increases in flooding following tropical cyclones that impact these basins.

"In the discussion section you have outlined some limitations, but I think you could add that the intensity of the storms could be lower in May and December than the average statistic used. This could mean that the expected increase could be less as well as greater to what you have presented in the paper. I believe in the further study these issues will be addressed, but I think this limitation should at least be mentioned here."

C2

We added this as a limitation to our study on the line suggested in marked up pdf.

"Lastly, a brief discussion about the uncertainty associated with the DFO satellite river discharge measurement sites needs to be included."

The following sentences about the DFO satellite river gages were added:

Brakenridge et al. (2012) tested the accuracy of DFO satellite river discharge measurements and reported regression r^2 values > 0.6 . They also provide a site specific "Quality Assessment" which, for sites in the United States, is based on calculating the Nash-Sutcliffe (NS) statistics for the DFO site and near gaging station hydrographs (Brakenridge et al., 2015). For the Mobile River site, for example, the DFO "Quality Assessment" ranking is 2 (Fair), which means that the NS statistics were > 0.44 . However, since both bankfull and time series discharge are estimated from the same source in this study, while the absolute value may somewhat differ from the actual discharge, temporal trends and fluctuation magnitude were found to be well captured. This is clearly evident in the Mobile River DFO site (<http://floodobservatory.colorado.edu/SiteDisplays/467.htm>).

Please also note the supplement to this comment:

<http://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2016-320/nhess-2016-320-AC2-supplement.pdf>

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., doi:10.5194/nhess-2016-320, 2016.