

## ***Interactive comment on “Challenges to Implementing Bottom-Up Flood Risk Decision Analysis Frameworks: How Strong are Social Networks of Flooding Professionals?” by James O. Knighton et al.***

**James O. Knighton et al.**

jok8@cornell.edu

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We thank reviewer 2 for their specific comments on our work, particularly the comments related to the framing of our research.

- Based on the case study of the Tompkins County, the paper helps for understanding the social network of flooding professionals is to begin a bottom-up vulnerability-based flood hazard mitigation plan. The work is valuable and interesting. I think the paper is likely worth publishing.

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- Comments:

- 1. The study is conducted through a case study in the Tompkins County, the population of which is approximately 100,000 people across 1300 km<sup>2</sup>. Although the authors have discussed broader impacts of their bottom-up decision analysis frameworks, a more complete and clear discussion about the scale of the framework could be used. Is it applicable for other larger or smaller counties? How can the framework be "bottom-up" to states?

- 2. It mentions that the Tompkins County is a community dealing with moderate flooding. So, is the framework applicable for other communities dealing with other types of flooding?

We are grouping our response to these comments 1 and 2 as they cover similar issues. First, we agree with the reviewer that more elaboration will allow the paper to have a broader impact. We have revised the broader impacts section as follows:

“It is worth discussing that several aspects of our study catchment may have implications for how these results can be interpreted and applied to other locations. Our research focuses exclusively on a network of professionals within Tompkins County New York (US), with a distinctly bottom-up structure for flood governance. The county is moderately sized (population of 100,000) and experiences moderate flooding (~9 year recurrence interval for socioeconomic riverine flood losses).

With respect to county population and flood loss frequency, we can possibly anticipate that the social connectedness of professionals would increase with increasing community size and flood frequency. Both larger populations and increased frequency of hazards could lead to more complete records of historical floods and increased among professionals. It is possible that increased exposure to flood frequency would reduce cognitive biases (e.g. Merz et al 2015) leading to an “adaptation effect” (Di Baldassarre et al 2015). Conversely, less exposure as would be expected with a smaller population and less flooding risks would be expected to decrease social understanding of flooding

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risks (Collenteur et al. 2015) and less established networks of professionals.

Broadly, there are several aspects of this research which may allow our results to be more globally applicable. First, the local governmental and institutional organization of this case study mirrors that of other US and European cities, which suggests the possibility of similar institutional vulnerabilities associated with local governmental-, private-, and community-organizations. For example, Bracken et al. (2016), studying flood management within the UK, describe a similarly loose coalition of experts from governmental and non-governmental organizations to those observed within our research. Second, the reliance of bottom-up decision analysis frameworks on networks of people exists independent of local governmental structure, and would likely contribute similar vulnerabilities as we have observed. Merz et al. (2015) review a series of historical floods across Europe that resulted in increased devastation as a result of “surprise.” Surprise is then attributed by Merz et al. (2015) to cognitive biases “hardwired in the human brain.” It is possible that the divergent perceptions and definitions that we observe among Tompkins County professionals are indicative of universal human traits rather than simply a local phenomenon. Finally, our methodology is easily adapted, and could be applied to uncover new vulnerabilities in parallel governmental structures in other nations.”

- 3. Page 7 Line 9: 8% of 50 responded professionals are 4, but (2 policy, 1 education and outreach, 1 government, and 1 advocacy).

Yes, this was a typo. The correction reads: “10% were not knowledgeable on the subject...”

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