

## ***Interactive comment on “Vulnerability analysis in Complex Networks under a Flood Risk Reduction point of view” by Leonardo B. L. Santos et al.***

### **Anonymous Referee #3**

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The submitted manuscript presents the concept of Geo-graph and use it to model vulnerability for route access. Some comments and questions are presented below.

Comments: \* The abstract should include highlighting results beyond mention “Our results can represent an important tool for stakeholders from the transportation sector.”; \* Page 1, Line 20: double citation for a same author; \* Second and third paragraphs in introduction section may be collapsed. The authors are invited to check similar occurrences on next paragraphs; \* Please, check the journal directives about citing/referencing – as written on Page 2/Line 4, “...as presented in (Yin & Xu (2010); Santos et al. (2019))”, the included parenthesis looks inadequate for this kind of citation. The authors should consider this concern for the entire manuscript; \* Furthermore, paragraph of single phrase should be avoided (e.g., Page 2, Line 7 and more); \* Last

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paragraph of Section 1 looks out of context. The authors may rise such problematic before state the use of Geo-graphs as a tool on flooding situations; \* Any previous study or similar research (on the Geo-graph point of view) were cited. If this is a pioneer study, the authors should ensure and then highlight it; \* Page 2, Line 25: check decimal/thousands separator on English writing; \* Include a figure to express the study area location (South america → Brazil → State) may help the study/manuscript understanding; \* Page 3, Line 3: Since Herrmann et al. (2014) has more then one author, the pronoun “He” is inadequate; \* Page 3, Line10: Use acronym for institution citation, instead of Universidade Federal de Santa Catarina; \* Regarding a path dij, always is possible to find j from i? Are defined paths with null cost? If yes, how the efficiency is computed in such cases? Why the efficiency is inversely proportional to dij? The proportional symbol was wrongly chosen; \* A discussion about the vulnerability on k (the meaning behind the mathematical definition) should be included – what such model means? \* Page 3, Line 30: What means a vulnerability of 3%? How such value is interpreted/understood? \* How Figure 1 was generated? The author may include a graph representation for “lengths” information used to achieve Figure 1; \* Discussions regarding Figure 2 should be improved/enhanced; \* How the flood susceptible areas on Figure 2 were obtained? How such areas affect the path’s susceptibilities? Low susceptibilities are found near to flood areas – isn’t expected the inverse behavior? \* Figure 2 caption is missing. What means the numbers 1 and 2 on Figure 2? \* The last paragraph of Section 3 looks out of context; \* The conclusions should be improved/enhanced;

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