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## ***Interactive comment on “A spatio-temporel optimization model for the evacuation of the population exposed to natural disasters” by H. Alaeddine et al.***

**H. Alaeddine et al.**

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1. Page 2, Line 3: the development of effective evacuation systems.
2. Page 2, Line 5: traffic network, accessibility.
3. Page 2, Line 19: The evacuation plan must avoid.
4. Page 3, Line 8: fixing for each household
5. Page 3, Line 10: the evacuation of stakes (buildings, nuclear centers, hospitals, etc.)

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6. Page 3, Line 21: systems and decision support
7. Page 4, Line 10: to leave safety the risk zone
8. Page 4, Line 24: human behavior and interaction between vehicles. Indeed . . .
9. Page 4, Line 27: mesoscopic models
10. Page 5, Line 4: and traffic assignment models. This choice is a trade-off between the accuracy of the microscopic model and the application of the macroscopic one (modeling of large networks). The first stage. . .
11. Page 5, Line 19: inhabitants of site exposed to hazard
12. Page 6, Line 1: of flooding, was given
13. Page 6, Line 10: evacuation model STOM.
14. Page 6, Line 11: the formation of the spatial input
15. Page 8, Line 6: distance to hazard “air-line distance”
16. Page 8, Line 14: by the affected population.
17. Page 9, Line 5: persons located in the risk zone.
18. Page 9, Line 11: level of risk. This level of zonal risk
19. Page 9, Line 13: have the same risk level
20. Page 9, Line 22: it is based on the most exposed areas which need. . .
21. Page 10, Line 5: according to their exposures.
22. Page 10, Line 21: is subjected to road capacity,

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23. Page 11, Line 8: flood dykes breach.
24. Page 11, Lines 10-18: Move this paragraph please to the beginning of the last section: conclusions (page 16, line 5).
25. Page 12, Line 5: ... and the number of nodes. This index indicates, to some extent, the connectivity of network. Normally it ranges between 0.5 and 3 (cite-Sharma). The numbers bellow show that the networks of the two sites of study (Tours and Gien) are approximately 220% connected (citeBhaduri).  
@ARTICLE Sharma, author = H.S. Sharma and P.R. Binda, title = Modeling in Resource Management and Environment Through Geomatics, journal = Concept, 2007, xiv, 304 p, figs, tables, ISBN : 8180694879, year = 2007, volume = , pages =  
@ARTICLE Bhaduri, author = Sukla Bhaduri, title = Transport and regional development, journal = Indian Council of Social Science Research. Concept Publishing Company. ISBN : 81-7022-342-3, year = 1992, volume = , pages =
26. Page 12, Line 16: of estimating the accessibility of roads during the flood, we focus...
27. Page 12, Line 18: in turn based on the risk of people...
28. Page 15, Line 24: with a reduction of network capacity equal to
29. Page 16, Line 8: as delay departure, non-compliance with evacuation paths calculated, accidents...
30. Page 16, Line 19: different priority list established
31. Page 16, Line 24: Of course, the validation of an evacuation plan requires also the realization of real evacuation exercises by policymakers. From...

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32. Page 25: Caption: Assignment of buildings to safety points. Buildings in green are assigned to the shelter of North (ZRO du Nord) and the remaining buildings (in brown) are assigned to the shelter of South (ZRO du Sud).
33. Page 27: Caption: Division of the two zones (relative to the two rivers), each into three sub-zones. Zone  $[0, 300[$  of each zone is the area that lies between 0 and 300m from the river, etc.
34. Page 28: The categories are chosen automatically by the software ArcGis according to the number of categories (5) and the maximum capacity 18449. For having interval  $[0, 1000[$ ,  $[1000, 2000[$  etc. we have to increase the number of categories to 19 ?
35. Page 31: Caption: Evacuation scheduling of the valley of Tours. Each subfigure shows the evacuated buildings and the paths taken during the slot itself. (a) Time slot 1 ...
36. Page 32: Caption : Evacuation of buildings of the districts of the city of Tours; priorities list (Expositions of districts according to destruction areas). Each building (X-axis) is represented by a circle where its size indicates the number of vehicles evacuated from this building. Each color represents a district.
37. Page 33: Caption : Representation of the evacuation of neighborhoods of the city of Tours based on their expositions. Each building (X-axis) is represented by a circle where its size indicates the number of vehicles evacuated from this building. Each color represents a risk level ( $[0, 300[$  ;  $[300, 900[$  ;  $[900, +[$ ).
38. Page 35: Caption: ... (a) Buildings to be evacuated (in red), (b) ...
39. Page 36: Caption: ... (b) evacuation of the valley of Gien (each color represents a time slot)

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40. Page 38: Caption: ...site of valley of Gien. Each color represents a time slot.  
The buildings in blue are isolated buildings.

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Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 3, 1, 2015.

**NHESSD**

3, C188–C195, 2015

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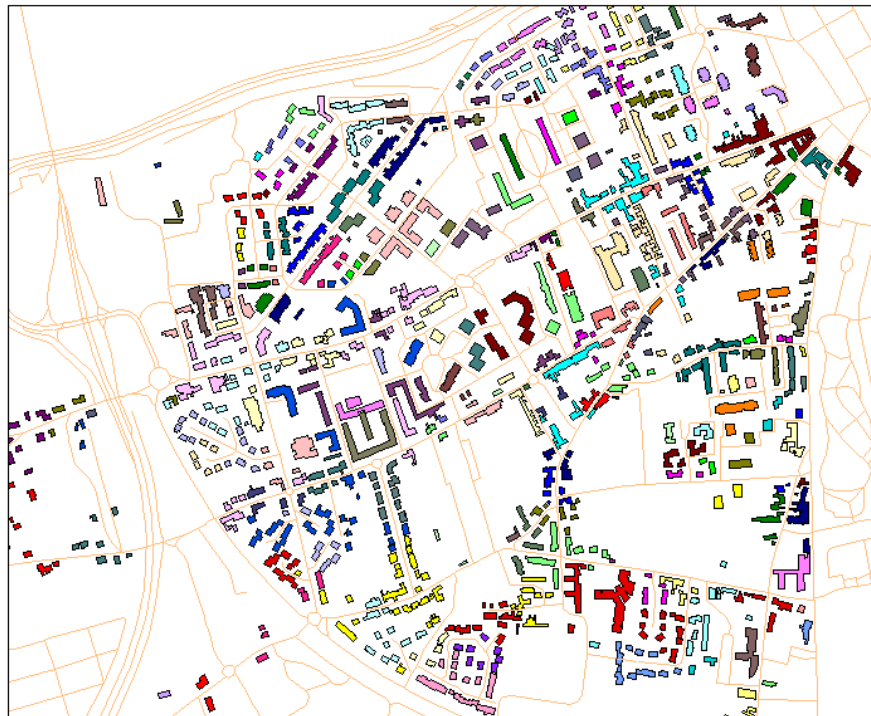
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Created by: K. Serrhini and H. Alaeddine, 2015

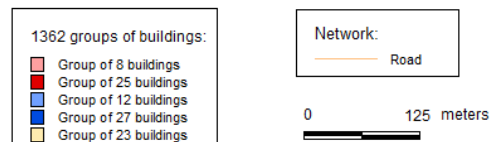


Fig. 1.

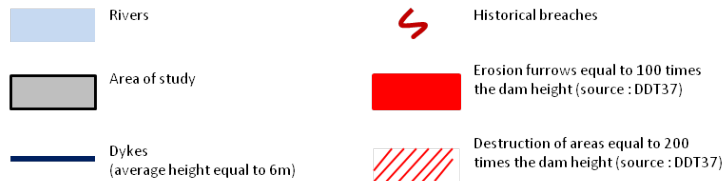
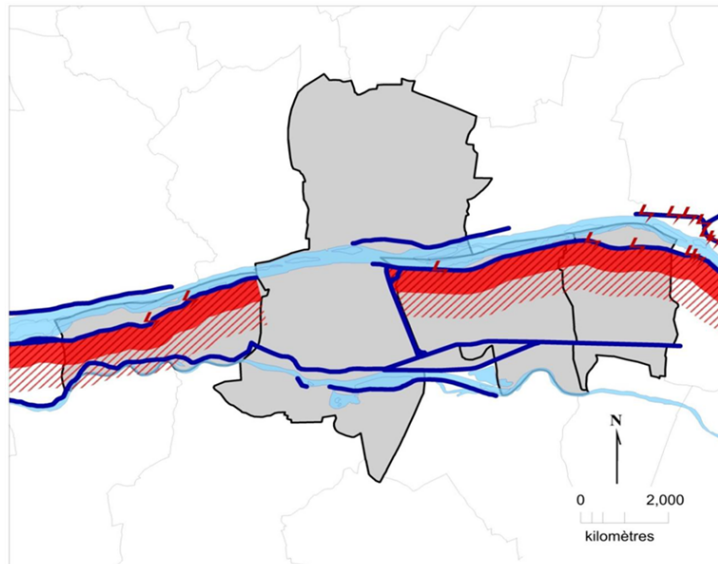
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Fig. 2.

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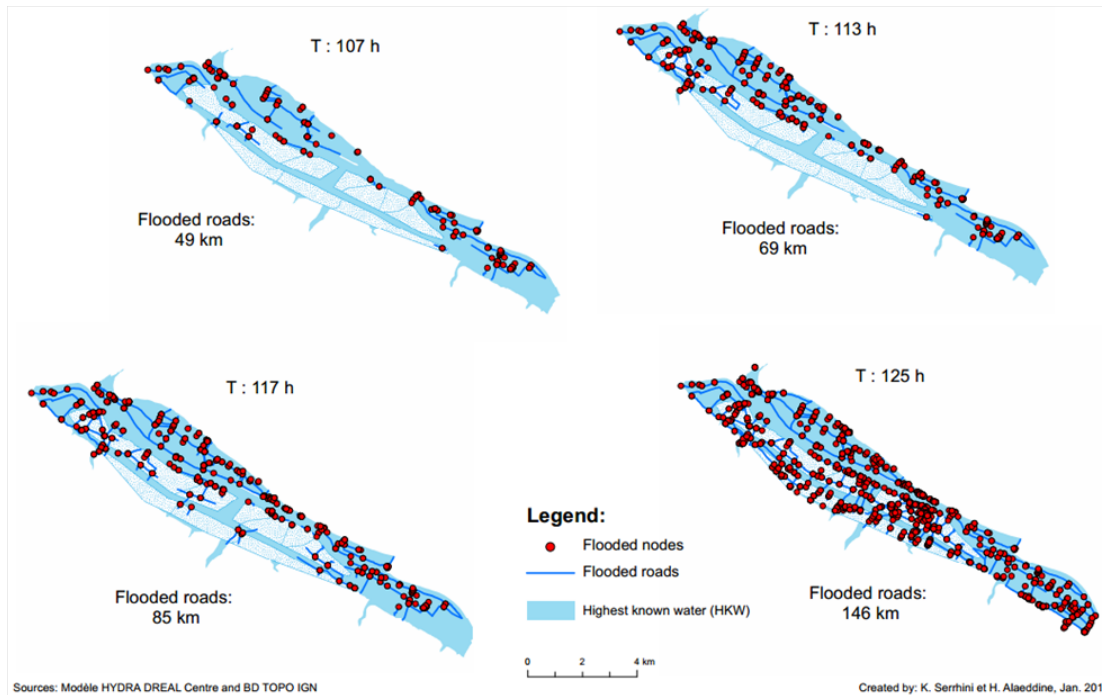


Fig. 3.

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