

Interactive comment on “Revision of the geological context of the Port-au-Prince, Haiti, metropolitan area: implications for seismic microzonation” by M. Terrier et al.

Anonymous Referee #2

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General comments

The manuscript deals with some aspects related to the seismic microzonation of Port-au-Prince (Haiti). Special attention is paid by the authors to the geological study (lithology and fault mapping) and the landslide hazard. The item is an important task to be considered in order to supply technical knowledge on which to base the decision-making process, especially considering the fact that Port-au-Prince is characterized by a high seismic hazard and it is located in an alluvial plain where site effects are likely to be experienced. On the one hand, as declared by the authors, the geological studies illustrated in the manuscript will be of full usefulness only after further in situ investiga-

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tions (e.g.: geotechnical data, geophysical surveys, paleoseismological trenches) that will allow the analysis of possible seismic amplification phenomena and the characterization of the active faults in depth. On the other hand, the landslide hazard analysis discussed by the authors already gives advice to the stakeholders about the rules to be followed to build properly. To my mind, the manuscript is interesting but I recommend taking into account some critical aspects to improve the quality of the work.

Specific comments

Paragraph 2: The geodynamic background

To underline the importance of the seismic microzonation study proposed it is also necessary to deal with the site seismic history of the Port-au-Prince. Therefore, more details about the damage caused by the cited historical earthquakes in the chief-town of Haiti should be included.

Paragraph 4.1: Method

It is known that exhaustive inventories of landslides triggered by earthquakes are the crucial point to perform suitable earthquake landslide hazard analyses. Therefore, the evaluation of the quality of the landslide inventory is an essential task. From this point of view, the paragraph is quite muddled. The authors should show better the features of the inventory used indicating the time span covered through it, the sources of information of landslides and rock-falls, the completeness and quality information and so on. Moreover, the paragraph is lacking in a complete overview of the state of the art about the landslide hazard estimation. In addition, the method that the authors adopted should be explained in a better way. Indeed, the authors declare that “. . . The approach is comparable to that of Mora-Castro et al (2012) but reposes on more precise mapped data and a more complete inventory of ground movements”. It is necessary to show briefly what this method consists in, what differences are implied in the use of the two different approaches in the hazard estimates.

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Paragraph 5 Implications for preventive seismic recommendations

This paragraph discusses the geological study and landslide/rock fall hazard analysis. As regards the former, the authors pay attention especially to the faults. However, the discussion about the soil features (to which the authors dedicate a wide paragraph) is also very important in view of analyzing the amplification phenomena. Can the authors analyze this aspect? To help doing this it should be useful to consider the building damage pattern caused by the 2010 earthquake in Port-au-Prince metropolitan area. Can the authors compare and discuss the spatial distribution of the earthquake building damage in the metropolitan area with the lithological/geological features of it? What suggestions can be drawn?

Technical corrections

English should be improved throughout the manuscript: e.g. "Informations"

"Soil response capacity": what do the authors mean?

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