



Interactive
Comment

Interactive comment on “Assessment of tsunami hazard for the American Pacific coast from southern Mexico to northern Peru” by B. Brizuela et al.

Anonymous Referee #2

Received and published: 23 August 2013

GENERAL COMMENTS

This paper deals with the tsunami hazard assessment for a part of the American Pacific coast, from Mexico to Peru.

After a quite descriptive introduction, the paper presents two different parts:

First, a description of the geotectonics and seismicity of the study area is carried out through a bibliographic review. The geotectonic study shows the plates that go into play in Central America, explaining their origin and the interaction among them. Then, a compilation of tsunami events in Central America by studying currently existing cata-

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logues is carried out, referring several authors or databases.

Then, the assessment of the tsunami hazard itself is undertaken but only studying tsunami local sources. To get it, a hybrid probabilistic-deterministic analysis method is used. The return period and occurrence rate of tsunamigenic earthquakes are evaluated from a probabilistic point of view. On the other hand, the Run up distribution along the coast is calculated from a deterministic point of view by using a simplified analysis.

Finally, the authors show the results of the study and give some conclusions.

The topic of the paper is suitable for the journal since it addresses an issue of interest to the scientific community. Assessment of tsunami hazard for the American Pacific coast from southern Mexico to northern Peru has been analyzed with interesting conclusions, considering the lack of studies in this region. However, it cannot be said that the applied method or the conceptual approach and results stand a significant or novel contribution even if they don't lack scientific rigor. Additionally, the method assumes many hypotheses and so, the results can only be taken as an approximation. The considerations explained in this review must be taken into account before the paper could be ready for publication.

The authors explain the assumptions they take into account. Besides, they recognize the simplicity of the methodology, and explain that it can only be taken as a preliminary analysis. But, even if these issues are commented, I miss some validation of the methodology. The authors must give a comparison between their methods and some numerical simulation results or real field data in order to give some validation to the methodology. From my point of view, even if future research aspects in this direction are commented in the conclusions chapter, some validation should be given.

Given that numerical model simulations are not used, Green's formula is applied instead of calculate the propagation of the wave. Refraction and reflection are not considered in the formula so the requested validation will measure if the influence of these processes is important or not.

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In general, concepts are widely explained and repeated in the paper. The authors must detail them more concisely, what would reduce the length without losing significance and providing clarity to the article.

SPECIFIC COMMENTS This reviewer would like to give some comments or suggest corrections in order to increase its overall significance.

-Page 2984, Line 10: The text”, a statistical “first and then a deterministic analysis”, is not clear. After that, in 2985-L 28, “hybrid probabilistic-deterministic analysis” is used, what expresses better the concept of the methodology.

-Page 2984, Line 23: Maybe the population living at coastal sites could be given (if available) instead of the total population, because, actually, they are the affected group in case of tsunami.

-Page 2991 Lines 9-14: Please elaborate on the decision you made about the use of earthquake catalogs to perform the statistical analysis. What other options have you considered? And why have you rejected them?.

-Page 2993, Line 20: Please clarify what completeness periods are.

-Page 2996, Line 11: Please elaborate on the decision of choosing the transects associated to bathymetry normal to the trench. Intuitively, the transects normal to the coast adjust better when Green’s formula is used.

-Page 2997, Line 3: Please explain the criteria you used to select the 130 bathymetric profiles and why you have considered that this number is enough to give a good approximation for the run up distribution along the coast.

-Page 2997, Line 4: Rewrite the sentence “They tend. . .”

-Page 2997, Line 8: You have simplified the transects by considering 2 ramps. This assumption implies some limitations that should be explained in the text of the paper, as well as other assumptions limitations are properly detailed.

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-Page 2998, Line 2: An explanation about the election of the rigidity value ($5e10$ Mpa) must be given in order to understand why it is suitable in this case.

-Page 3002, Line 6: Local effects are not taken into account, as detailed on general comments. The influence or not of these processes could be measured by comparing some results to real or simulated cases, and a conclusion in this direction should be added.

OTHERS:

-Page 2987 Line 26: The sentence “The cocos-Caribbean....along the junction” needs a stop.

-Page 2988, Line 19: Replace estimation with estimationS

-Page 3001, Line 1: “indeed” instead of “I deed” must be written.

Figures:

Figure 4 contains the seismic acatalogue AMB_AD_NOAA. And the figure 5 is exactly the same but shows tha zoification. Just one of the figures is necessary because the data contained on figure 4 can perfectly be referred to

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