

Interactive comment on “Application and prospect of high-resolution remote sensing and geo-information system in estimating earthquake casualties” by T. Feng et al.

T. Feng et al.

tienan_feng@126.com

Received and published: 1 April 2014

Thanks for the careful comments from the referee. To be honest, we have learned much from these comments. The referee gave much valuable suggestion to help us improve our work. After reading these comments carefully, we also have found a bridge to connect our work to a mature researching area. Before we respond to these comments, questions from the referee were organized and listed below: By the way, the line and page information marked in the Author Comments corresponded to the manuscript without correcting trace that is uploaded through the “My Author Overview”. Supplement contained the corrected manuscript with correcting trace. General comments

C2921

Question 1. Fails to mention the essential aspect of knowing the spatial population distribution Answer: A description “Besides the building damage, the spatial population distribution and its change in an earthquake region are factors influencing the casualty. An earthquake-prone region with more people has greater potential risk. Not just in earthquake relief, issue of the spatial and the movement of population is also critical from public health to homeland security (Chen, 2002;Dobson et al., 2000;Hay et al., 2005;Sutton et al., 2001). Compared to traditional map of people distribution, the high-resolution geospatial and temporal map is more useful and being researching(Bhaduri et al., 2007;Aubrecht et al., 2013). The map can be used in not only earthquake relief but also evaluating risks (Zuccaro and Cacace, 2011;Aubrecht et al., 2012;Freire and Aubrecht, 2012).” is added in line 18, page 4, in the corrected manuscript without correcting trace..

Question 2. Issue of geospatial and temporal distribution of people Answer: This question was answered in three parts. In the part of introduction, we have added some references regarding the geospatial and temporal distribution of people; and illuminated their importance, and researching progress (see Question 1). In the subpart of Methods, the model was modified. The independent of time and other factors were also considered when the distribution of people was involved (see equation 2, 4, 5, in line 20 of page 8 and line 4 and 8 of page 10 in the corrected manuscript correcting trace). Because of limitation of studying areas, the geospatial and temporal maps were not available. Having a deep analysis and verification from colleagues, an explanation, “Areas of this study were less-developed region. The high-resolution geospatial and temporal map was unavailable. Compared to metropolitan areas such as Beijing and Shanghai, regions in this study were relative closed; and the condition of personnel mobility was in a low level. Except studying area in Wenchuan earthquake, nearly all residents in other two earthquake events were in their houses or departments. To lessen the predicting error, buildings were classified according to their DI and MSI. Then, the predicting casualties came from the sum of each type of buildings not each building. Therefore, the local statistical data is referred in this study.”, was added in line

C2922

14 of page 12. In the part of Results and discussions, we reviewed our results and found that predicting results were more accuracy when earthquake did not happen in work time. Generally, predicting counts were large than actual counts when earthquake attacked in work time. This was consistent with our explanation in line 14 of page 12. In the manuscript, a sentence, "The predicting accuracy of Bam and Yushu earthquake were higher than the result of Wenchuan earthquake. Besides the effectiveness of model, the time when earthquake happened was also critical. When Bam and Yushu earthquake happened, most of people were still at houses. A number of people may stay outside when Wenchuan earthquake occurred. The predicting results in Xinfu and Xujia town were more than actual counts. Because of the limitation of local economic level, the build of the high-resolution geospatial and temporal map required a longer time. It was inferred that when earthquake happened in work time, a corrected parameter that was smaller than 1 could be added into our model. In the case of Dujiangyan, when we set the corrected parameter equal to 0.9, the predicting error was less than 4%. However, it is essential to building the map. Methods with less cost and energy are encouraged to enhance the processes." is added in line 15 of page 17.

Specific comments Question 3. "Talking about the 'prevention.. of earthquake' (7138, line 24) is scientiñçally not correct" and "Previous researches can contribute much to the prevention of earthquake (7140, line 9)" Answer: The two pointed have been corrected as "Based on technology that already exists, the prevention of earthquake is impossible. However, its impacts can be mitigated and minimized by proactive risk reduction; and better response actions can be coordinated, which drew a great deal of attention." in line 2 of page 3 and as "Previous researches can contribute much to weaken the impacts of earthquake, but new technique must be introduced to help the relief of earthquake." in line 6 of page 5.

Question 4. "Building damage is the main contributor to earthquake casualty except some countries, such as Japan". (7138, lines 25/26) Answer: The point has been corrected as "Building damage is the main contributor to earthquake casualty in most

C2923

of developing or underdeveloped countries. In the developed ones, some countries, such as Japan, secondary disasters, fire for instance, were the main contributors (Yamazaki et al., 1996)" in line 4 of page 3. Question 5. "... casualty estimation is the primary information to support the design of rescue plan" (7139, lines 11/12)." Answer: The point has been corrected as "Among all rescue activities, casualty estimation is one of the crucial information to support the design of rescue plan." in line 16 of page 3. Question 6. Correction of Figure 1 and section 2 Answer: the Figure 1 has been re-written and detailed description was also added in the page 6 from line 10 to 20. Technical comments Question 7. Figure 1: In the text it is referred to 3 parts of the model when pointing to figure 1. Answer: all part was illuminated in new Figure 1. Question 8. Figure2: It may be better to refer to the x-axis as 'Rate of fatalities' as it is indeed about the actual death rate, independent of additional injuries as far as I understand from the text. Answer: The x-axis of Figure 2 has been corrected as "Rate of fatalities". Question 9. Figure 3: Labels are very hard to read. Answer: Figure 3 has been re-plotted. Question 10. Grammatical problems Answer: We have read the manuscript for times. Grammatical errors were corrected as possible as we can. At last, we upload the manuscript with correcting trace as the supplement of Author Comments (AC)

Please also note the supplement to this comment:

<http://www.nat-hazards-earth-syst-sci-discuss.net/1/C2921/2014/nhessd-1-C2921-2014-supplement.pdf>

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 1, 7137, 2013.

C2924