Nat. Hazards Earth Syst. Sci. Discuss., 1, C230–C233, 2013
www.nat-hazards-earth-syst-sci-discuss.net/1/C230/2013/

Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Intercomparison and validation of building damage assessments based on post-Haiti 2010 earthquake imagery using multi-source reference data" *by* G. Lemoine et al.

Anonymous Referee #1

Received and published: 21 May 2013

general comments

The authors propose a series of comparisons between different approaches to information extraction for Post-Disaster Needs Assessment from multispectral optical remotely sensed data, commenting on the specific similarities, correlations and differences among the output from the different types of data and extraction methods.

The general impression is that every single comparison was done with a sufficiently careful approach (with some exceptions as stated in the "detailed comments" below), but all in all the comparison does not convey much information to the reader as, by ad-

Full Screen / Esc
Printer-friendly Version
Interactive Discussion
Discussion Paper

mission of the authors, each single dataset had features, scopes (in space and time), and characteristics that were significantly different. Some managed to detect minor damage statuses, others didn't, others had gaps and in almost all cases damage scales did not match. Although the authors strived to rework the data to make comparisons as meaningful as possible, it seems to me that the scientific contribution remains limited, because the comparison was made between inherently inhomogeneous datasets. Since it turns out there is no real, dependable reference dataset, I would see it more useful to review the main methods that were used to produce the damage maps and discuss the respective advantages and disadvantages without spending too much effort to the (too) ambitious goal of a homogeneous comparison.

specific comments

Chapter 1: the review of damage assessment method completely overlooks anything which is not based on multispectral optical data; yet, a LIDAR acquisition campaign and a pre-post-event COSMO/SkyMed spotlight pairs were also acquired on Port-au-Prince, not to mention stripmap TerraSAR-X data. Damage assessment methods have been developed based on non-optical EO data, and a mention of those methods should be made for sake of completeness, to avoid a misleading message that visual interpretation (possibly semi-automated) of real-colour depiction of multispectral data is THE damage assessment method, anything else being marginal, if any.

End of Ch.1: "using as a reference an extensive field campaign . . . "; though, as later reported in paragraph 3.0.3, results of this field campaign raise quality concerns in terms of gaps, duplicate classification, inconsistencies. Would you really call it a "Ground truth" to benchmark the other results against?

Par. 2.2: "(EMS) 1998 . . . scale defines 5 damage grades: grades 1 to 5 should ideally represent a progressive increase in the strength of shaking for different types of masonry and reinforced-concrete buildings". Actually the EMS damage scale is a purely effect-based scale, no implication is made on shaking strength, which may exhibit di-

NHESSD
1, C230–C233, 2013

verse links with the damage level according to building vulnerability, time evolution of ground acceleration, directional effects, etc.

Ch. 4: page 1457, rows 20-24: in my humble opinion, the mismatch in spatial resolution between decimeter-order resolution datasets and spatial mismatches of the same order of magnitude do not justify killing a lot of information by averaging everything down to the size of 50 m. Also, crunching everything down to a rectangular grid average - irrespective of the image content - does not appear to me to be the best aggregation strategy. A content-aware partition e.g. cutting along urban block boundaries would be more respectful to the data nature - and would in principle create more homogeneous datasets. I appreciate the checkerboard partition allows defining a local correlation, but this is discussed later.

Ch. 4, page 1458, rows 21-22: to me the colour-coded correlation map in figure 6 is all but informative. It may only be a visualization issue, but frankly I am at loss to understand what figure 6 adds to one's understanding of the situation. The spatial distribution of un-correlation is meaningless if it is not linked to the distribution of specific local features. Histograms are more informative in assessing how do two distribution match, whereas the spatial distribution is much less relevant. I would for sure sacrifice the 50m grid in favor of block-based partition and a single statistical series of damage values covering the entire urban area, thus generating a single correlation value.

Par. 5.2.1: please consider how much of this discussion is independent of the spatial location of the single 50m-sided square cells

Ch. 6, page 1467, row 13: the claim seems a bit excessive, unless they refer only to the Port-au-Prince case. Kerle (2010) made a comparison among satellite based assessment methods on the Indonesia earthquake, in the paper correctly cited by the authors.

Ch. 6, page 1467, row 25-27: "overestimation of the damage in commercial and low density residential areas is compensated by underestimation in industrial areas". If

NHESSD

1, C230–C233, 2013

so, the analysis in 5.2.2 which led to apparently accurate estimates is probably more fragile than implied in its discussion.

technical corrections

page 1457, rows 15-16: missing grade 2?

page 1457, row 25: check "16"

page 1465, row 14: check "a reasonable accurate"

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 1, 1445, 2013.