

**Manuscript Review for nness-2013-289, *Assessment Methodology for the Prediction of Landslide Dam Hazard* (authors: S.F. Dal Sasso et al.)**

**Review by Robert L. Schuster (e-mail: [RLSchuster25@msn.com](mailto:RLSchuster25@msn.com)), 25 November 2013**

I have received two slightly different sets of instructions for my review. I will try to follow both sets.

**1) Scientific Significance. Does the manuscript represent a substantial contribution to the understanding of natural hazards and their consequences?**

**Rating: Good.** The manuscript presents new methods on an important topic.

**2) Scientific Quality. Are the scientific and/or technical approaches valid?**

**Rating: Good.** The methodology seems to be valid, and the authors have done a very good job of searching and referring to the literature on landslide dams. (I know a lot about landslide dams, but not a lot on the probability of landslide damming – an important topic.)

However, in noting that the authors have tied their theoretical approach (derivation and selection of probability theorems), I don't think they have shown that their case study has been validated by the presented theorems and equations. I feel that they should follow their theorems and equations by an analysis based on their case study, an analysis that has some solutions and real numbers in it. That is: show your readers how the equations apply to the case study they've presented. Note: I think that the authors feel that they have used their test case for figure presentations. but I don't think the figures by themselves really show how the case study relates to the theory. I feel that a few more words relating theory to the case study are needed in th text.

I also feel that the authors should note that the case they've presented really represents a rather small landslide dam. The most hazardous landslide dams are considerably larger than the authors' case study, and can result in much larger upstream and downstream floods. Of considerable importance is how well their equations will deal with the probability of a larger landslide dam. Such as some of the case histories available in the literature (e.g., Val Pola (Mount Zandila), Italy, 1987; Bairaman River, Papua New Guinea, 1985; Mayunmarca, Mantaro River, Peru, 1974; Tsao-Ling, Taiwan, 1999; La Josefina, Ecuador, 1993, etc.). Application of the theory and equations in this paper to a larger landslide dam could be accomplished by someone in a future paper (possibly by the same authors).

**3) Presentation Quality**

**Rating: Good.** I think the scientific data, results, and conclusions have been presented in a clear, concise, and well-structured way. However, the English language and simplicity of the language could use some improvement (for detailed, line-by-line suggestions, see **(#20)** below).

**4) For final publication:**

**The manuscript should be accepted subject to minor revision.**

The other set of instructions Anna Feist-Poltner recommended I bring up from the NHESS website. These instructions contain the following questions and 21 steps (some of which duplicate what I have listed above):

**Scientific Significance: Good**

**Scientific Quality: Good**

**Presentation: Good (except for minor problems with the English language; see (#20) below for details).**

**(#1) Does the paper address relevant scientific and/or technical questions within the scope of NHESS?**

Generally yes.

**(#2) Does the paper present new data/and or novel concepts, ideas, tools, methods, or results?**

Yes, it presents new concepts, ideas, tools, and methods. It does not produce new results. I think some results should be added at the end in relation to their landslide dam case history.

**(#3) Are these up to international standards?**

Yes.

**(#4) Are the scientific methods and assumptions valid and outlined clearly?**

Yes.

**(#5) Are the results sufficient to support the interpretations and conclusions?**

I'm not sure. I think the paper would be more valuable if the authors would make it clear how to apply their final equations to their case history (see 2) above).

**(#6) Do the authors reach substantial conclusions?**

Generally yes. However, I feel their conclusions would be stronger if the authors would apply their final derived equations to their case study, with some real numbers, as suggested in 2) above. This would help the reader understand how to use these equations.

**(#7) Is the description of methods used and the results obtained sufficiently complete to allow their reproduction by fellow scientists?**

I don't really think so. The results would be more clear and useful if the authors would apply the derived equations to their case history (as suggested in 2) above).

**(#8) Does the title clearly reflect contents of the paper?**

Yes.

**(#9) Does the abstract provide a concise, complete, and unambiguous summary of the work done and the results obtained?**

**Generally yes.** However, I don't think use of the case study was as clear as stated in the Abstract.

**(#10) Are the title and abstract pertinent and easy to understand to a wide and diversified audience?**

**Yes, I think so, at least to an audience that is knowledgeable on the subject of landslides and probability theory.**

**(#11) Are the mathematical formulae, symbols, abbreviations, and units correctly defined and used?**

**Yes.**

**If the formulae, symbols, or abbreviations are numerous, are there tables or appendixes listing them?**

**I don't think they are used often enough to require tables or appendixes.**

**(#12) Is the size, quantity, and readability of each figure adequate for the type and quantity of data presented?**

**Generally O.K., but, as presented, some of the print is too small to read in Figs. 3 and 6, and possibly in Fig. 4. Can these figures be presented at larger scale than in the copy I reviewed? If not, I feel that some of the print should be enlarged to about double the size given.**

**(#13) Do the authors give proper credit to previous and/or related work, and do they indicate clearly their own contributions?**

**Yes, on both counts. No problem here.**

**(#14) Are the number and quality of references appropriate?**

**Yes, they've done a good job in finding and citing pertinent references.** However, I should note one exception: On page 5664, line 25, they've erroneously cited **Schuster (2000)**. (the reference, page 5678, is: Schuster, R.L. Dams built on pre-existing landslides, etc.) This is my paper, and it has nothing to do with landslide dams. Instead it deals entirely with the performance of man-made dams constructed on pre-existing slides. Both the citation and the reference should be deleted. I think this is a rather slipshod error by the authors.

**(#15) Are the references accessible by fellow scientists?**

**Yes, if they have good geoscience libraries or access through interlibrary loan.**

**(#16) Is the overall presentation well-structured, clear, and easy to understand by a wide and general audience?**

**It will have to be a technical audience that has some background in both landslides and probability theory. That is the audience it is intended for.**

**(#17) Is the length of the paper adequate, too long or too short?**

It is about the right length. However, I would like to see some additional text relating the authors' theory to their test case (as noted above).

**(#18) Is there any part of the paper that needs to be clarified, reduced, added, combined, or eliminated?**

As noted above, I feel the authors should add some words to the main text to clarify just how their theory is applied to their test case. This would help the reader understand how to use their equations.

**(#19) Is the technical language precise and understandable, fluent, simple and easy to read?**

Generally, yes.

**(#20) Is the English language of good quality, fluent, simple, and easy to read?**

In this case, I would like to present numerous detailed suggestions for improvements in wording, grammar, and/or punctuation, which, if followed, I think would improve the readability of the text and some of the figure captions. These suggestions in some cases don't represent errors, but I feel that their implementation would enhance readability. They are:

**p. 5664**, Line 4 – I prefer the term “upstream” to “backwater.” However, in Italian flood literature, “backwater” may be common usage. If so, I can live with “backwater (leave it up to the authors).

Line 9 – We need an “and” between “approaches,” and “is”.

Line 25 – As noted above, delete “Schuster, 2000”

**p. 5665**, Line 10 – Subject is plural. Therefore, delete the “s” from “refers.”

Line 17 – Add “have” to read “have proposed.”

**p. 5666**, Line 6 – Preferable wording and punctuation would be: named “Zillona”, mobilized—

Line 9 – “small” instead of “little”

Line 20 – “located on the western side of the Parrutta spring and south of the town of Trecchina.”

**p. 5667**, Line 3 – “limestones”

Lines 6 and 7 – “is also composed of a carbonate complex similar to the previous complex, and is located on the high slope of the Noce River.”

Lines 9 and 10 -- “consists primarily of the clay-marl Flyon complex, showing”

Lines 12 and 13 – Change to read: “slope of the Noce River”

Line 14 – “trans-current”

Line 17 – Add the article “a” to read: “with a predominantly vertical component.”

Line 19 – Substitute “strongly affected” for “widely interested”

Lines 20 and 21 – Delete “the”

Line 24 – I don’t think your readers will have any idea what the word “basculating” means. My dictionary says that it means “teeter-tottering.” Can you substitute “teeter-tottering.” Or does that make sense? Can you come up with a more-descriptive term that most readers will understand?

Lines 27 and 28 – Add “the” as follows: “which involves the “Crete Nere” and “from the Liguride Unit”

**p. 5668**, line1 – Capitalize “River” in “Noce River”

line 2 – Delete “of” to read “about 13 degrees” (use symbol for degrees as you have done; I can’t bring it up easily on my computer)

Line 3 – I think “geognostic” is a terrible term, not understood by many readers (at least not in the U.S. or Britain). My university dictionaries don’t include it. The U.S. *Webster’s Unabridged Dictionary* includes the word, but says it is “archaic.” The British *Collins English Dictionary* says it would be better to use the common term “geologic.” I agree.

Line 5 – Change the wording and punctuation to: “landslide, particularly,” i.e., delete the “and”

Line 7 – Add a frontal comma and change wording to give: “information, together with the results of the new geomorphological survey, allows”

Line 10 – Add the article “and” and a semicolon and make “landsliding one word to give: “depressions, and surface landsliding; a wide”

Line 11 – “terraces” should be singular: “terrace”

Line 12 – I really don’t know what “is referable to” means. Can the authors come up with better wording?

Lines 12 and 13 – Add a comma to “roto-translational.” By the way, I don’t know what the term means. “Translational” I understand, but not the “roto” part. Can the authors come up with a better term?

Line 14 – Simplify the wording to: “300 m a.s.l., is semicircular and it is”

Line 17-19 – Add the article “a” and a comma and change the wording to give: “ zone, a long and narrow debris flow is currently very active, and east of the source zone a similar debris flow also is active.”

Line 19 – Replace “an” with “on” and hyphenate “pre-existing” to give: “placed on a pre-existing drainage line,”

Line 20 – Delete the article “the” to read: “between 275 and 140 m a.s.l.”

Lines 20-21 – Reword as follows: “It is about 545 m long and the width”

Line 21 – Change wording slightly to: “the width varies from 110 m to 140 m.”

Line 18 – Change ‘width” to “wide” to give: “120 m wide”

Line 24 – Change to: “the Noce River”

Line 24 – Delete “time,” add a comma, and change wording slightly to read: “At present, some evidence of activity is very visible in the same areas”

**p. 5669**, line 5 –Replace “in” with “of” to give: “consisting of a basic”

Line 16 – Add the article “the” to give: “study, the SHALSTAB method”

Line 19 – Delete “the” to give: “hypothesis that steady-state conditions”

Line 20 – Change the wording to: “Assuming completely saturated”

**p. 5670**, line 7 – Singular verb: “was” instead of “were”

Line 8 – Hyphenate “steady-state”

Line 14 – Change “by” to “from” to give: “derivable from the”

Line 17 – “delimitate” is not a word. Do you mean “delimit?”

Line 19 – Add the article “the” and use a lower case “d” in “dfwalk” to read: “The dfwalk model”

Line 2021 – I would change the wording slightly to give: “2008) which integrates the D8 flow-routing method (O’Callaghan and Mark, 1984) with the random-walk theory “

**p. 5671**, line 11 – Add the article “the” so it reads: “level, the dfwalk”

Line 20: Add a comma: “surface, an”

Line 22 – I think it should be: “an energy equation” rather than “the energy equation” because more than one energy equation exists in science.

**p. 5672**, line 2 – Add a comma after “area” to read: “area, and”. And I think you mean “constant” instead of “costant.”

Line 4 – Add a hyphen, giving “finite-volume code”

Line 13 – Delete the comma after “approaches” to give: “approaches by the formulation”

Line 17 – Hyphenate “river-water”. (it is a “unit modifier.”)

Line 18 – Add a comma after “2003)” to give: Casagli, 2003), and to”

Line 21 – Replace “was” with “is” (It should be present tense).

Line 22 – **This is a technical question: What does the geomorphic index, DMI, measure? Is DMI a measure of probability? This is not clear.**

Line 26 – Use “greater” instead of “more”

**p. 5673**, line 11 – Capitalize “River” to give: “Noce River basin”

Line 19 – Add a “the” to give: “the dfwalk”

**p. 5673**, line 3 – “On” instead of “In” to give: “On the dynamic level”

Line 5 – “Noce River basin”

Line 12 – Change wording to: “to the main scarp of the landslide.” I don’t think you need “studied.”

Line 16 – “the dfwalk model”

Line 20 – Delete the article “a” to give: “in which partial or total”

Line 22 – Add the article “the” and add commas to give: “using, respectively, the VAPI method”

**p. 5675**, Line 1 – “that is possible”

Line 2 – “depending on the method used”

Line 5 – “use of the dfwalk”

Line 13 – “demonstrate”

Line 15 – “trajectories of the landslide”

Line 18 – I would use “rational” instead of “sensible”.

Line 21 – “take into account additional parameters”

Line 22 – “characteristics”

**p. 5676**, line 2 – Add “the” and use a lower-case “d” as you have elsewhere: “The dfwalk model”

Line 10 – “final results demonstrate”

Line 19 – “in the decision-making process associated in the forecast”

**p. 5677**, line 5 – You’ve left the “C” from “Cruden.” Dave Cruden wouldn’t be happy!

**p. 5678**, line 17 – I think it should be “landslide dams” (unless the original authors got it wrong).

Lines 24-26 – Delete Schuster reference. As stated earlier, this paper has nothing to do with landslide dams. Suggest you add the following paper early in your text where you are introducing the subject and have cited “Costa and Schuster, 1988”: the reference is Schuster, R.L. & Costa J.E., 1986, A perspective on landslide dams: In Schuster, R.L., ed., *Landslide Dams – Processes, Risk, and Mitigation*: Geotechnical Special Publication No. 3, American Society of Civil Engineers. p. 1-20. (This was our original paper. You’ve seen Geot. Spec. Publ. No.3, because you’ve cited another paper from it elsewhere.)

Line 30 – I’m sure that Fred Swanson intended the word “dam” to be plural: “Dams in Japan, in Landslide dams”

**p. 5679**, caption: “interference in the literature.”

**p. 5682**, caption – “(c) Dam-emptying process.”



p. 5687, caption -- “using the dfwalk”

p. 5688, caption – “using the dfwalk”

p. 5690, In your drawing, you use “Dfwalk.” Every place in the text you use “dfwalk.” Suggest that you change it in this figure.

p. 5692, caption -- “using the dfwalk model **(a)** and the FlatModel **(b)**”

p. 5693, caption – “using the dfwalk model **(a)** and FlatModel **(b)**

p. 5694, caption – “using the dfwalk model **(a)** and the FlatModel **( b)**

**That about does it for suggested grammatical corrections!**

**(#21) Is the amount and quantity of supplemental material appropriate?**

**If by this, they mean “figures,” generally yes. However, as noted previously, the type is a little too small on a couple of the figures.**

Bob Schuster  
Golden, Colorado  
November 28, 2013