

## ***Interactive comment on “Assessment of the 1783 Scilla landslide-tsunami effects on Calabria and Sicily coasts through numerical modeling” by Filippo Zaniboni et al.***

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**AUTHORS ANSWERS TO REFEREE #1's COMMENTS** We greatly appreciate the contribution of this reviewer. Here follow the answers to his very useful comments and remarks. In many of them, the reference to the page and line number of the new version appears. The manuscript in its new version is attached, with corrections and changes marked in red.

General comment: The manuscript aims in completing an earlier work based on the simulation of a lethal landslide generated tsunami along the Calabria coast. This paper simulates the tsunami effects in a new region, further away for the landslide source,

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in Sicily. This is scientifically significant in understanding the tsunami hazard in the area. The technical approach and the methodology applied are based on commonly approved scientific base and the presentation of the data and the results are clear and concise. The idea of reconstructing the morphology for better simulating the phenomenon is novel and proved valid. In order to give the paper a wider approach with a more general appeal, I would suggest discussing more the tsunami hazard and risk assessment issue. More specific, the conclusion of the last paragraph is very interesting and important and it would be nice if it is highlighted more. \*\*\* ANSWER \*\*\* Concerning the tsunami hazard and risk issues, the first has been discussed widely, while the second requires additional studies in order to quantify the impact on population and buildings. We believe it is a subject of great interest, but we prefer leaving it for future work.

Specific comments: It is not clear how the resolution of the GEBCO grid, which is usually 150m the best, was improved using nautical charts. Which is the resolution of these charts for this quite big area? The concern here is if the re-sampling of the GEBCO grid down to 50 m adds any details or it is just a “cell-split”. It might be the case that 50 m bathymetry grid resolution is needed, just to be at the same level as the onshore topography, which is usually at higher resolution than the bathymetry. If this is so, it should be clearly stated. \*\*\* ANSWER \*\*\* The part concerning the available datasets has been improved (page 8, lines 15-19 of the new version of the manuscript). Indeed, we did not use GEBCO, but EMODNET and we complemented it nearshore by means of the nautical chart covering the region of interest to allow for better accounting of local non-linear, effects.

With which kind of offshore data the 10 m resolution Grid 3 has been constructed. There is only information for the topography. IF such a resolution is artificial for the offshore region, this should be clearly stated. \*\*\* ANSWER \*\*\* Offshore data for Grids 3 and 4 have been retrieved from the same nautical chart digitized for the construction of Grid 2. We added sentence in the text (page 11, lines 27-28 of the new version).

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The swept area or sliding surface is represented in the figures as a polygon. Who did you define the limits of the area offshore? Was there a detail description in one of the reference papers? Moreover, the bottom limit would look better if it was not a straight line. \*\*\* ANSWER \*\*\* The slide boundary is one of the inputs provided to the landslide simulation code, and its definition was given more in details in Zaniboni et al. (2016), and not repeated here. It is designed basing: on the observed deposit; on the initial sliding body contour; on assumptions about the mass spreading during the motion.

Figures 8, 9, 10 & 11 should come after the reference in the text. \*\*\* ANSWER \*\*\* The figures have been moved after the text.

A clarification of the terms wave height, wave elevation and flow depth will improve the understanding of the manuscript. \*\*\* ANSWER \*\*\* Added terminology at Page 9, Lines 8-12 of the new version.

Use constant naming for the grids, e.g. p18 line 32 in contrast to p18 line 24 \*\*\* ANSWER \*\*\* Fixed.

Parts of the conclusions need rewriting. Some refinement in English language will improve the text. \*\*\* ANSWER \*\*\* Conclusions have been changed and reorganized.

For example, in the last line the word design fits better than “devising”, since it is common terminology for this subject. \*\*\* ANSWER \*\*\* Fixed.

Technical corrections:

Figure 1: In this figure Capo Peloro and Messina should be indicated in the inset, it should also be mentioned that the yellow arrows points at Scilla. The Google earth image needs indication of the north. Mt Paci should also be pointed in the figure. \*\*\* ANSWER \*\*\* Figure 1 has been modified according to these indications as well.

P2 line 10: “the cape of Sicily in front of Scilla” it might be more appropriate the term opposite instead of in front. \*\*\* ANSWER \*\*\* Substituted “in front of” with “facing”.

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P3 line 5: “inducing” consider forcing instead \*\*\* ANSWER \*\*\* Ok

p3 line 7: “ensuing” consider subsequent instead \*\*\* ANSWER \*\*\* We prefer “ensuing” since the tsunami is a consequence of the slide (Page 3, Line 12 of the new version).

p3 line 16: “outside” consider along instead \*\*\* ANSWER \*\*\* The tsunami effects are studied out of the surroundings of Scilla, in a wider domain.

p3 line 21: “vanish” consider attenuate instead \*\*\* ANSWER \*\*\* Ok

p3 line 24: “corner” consider part instead \*\*\* ANSWER \*\*\* Ok

p3 line 27: “about 40 m far from the today shoreline” consider “about 40 m onshore, in regard to the present shoreline” instead \*\*\* ANSWER \*\*\* Corrected “today” with “modern”.

Figure 2: Signs for east (E) and north (N) should follow the degree sign in parenthesis for latitude and longitude. The area marked in red is indicated as the landslide swept area. Consider using the term sliding surface instead. \*\*\* ANSWER \*\*\* Ok

p6 line 27: “the tsunamigenic failure was a purely subaerial collapse” consider “the tsunami generation was purely attributed to the subaerial collapse” or “the tsunamigenic source was a purely subaerial collapse” instead \*\*\* ANSWER \*\*\* Ok

p6 line 31: “scenario tsunami” consider “tsunami scenario” instead \*\*\* ANSWER \*\*\* Ok

p7 line 23: “CoM” initials should be defined, i.e. Center of Mass(?) \*\*\* ANSWER \*\*\* Correct, added at Page 5, Line 10 of the new version.

p8 line 15: “GEBCO” Which version of GEBCO and at which resolution. \*\*\* ANSWER \*\*\* See answer to the first comment in the previous section.

p9 line 2: “reports” considered illustrates instead \*\*\* ANSWER \*\*\* Ok

P9 line 14: “The picture of Figure 5” consider “The wave height distribution illustrated

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in Figure 5” instead \*\*\* ANSWER \*\*\* Ok

p9 line 16: “ranges” you mean reaches? \*\*\* ANSWER \*\*\* Ok, fixed

P10 line 2: “stretch” consider using area instead \*\*\* ANSWER \*\*\* Ok

Figure 5: “in the legend together with the inundation distance (I) and runup (R)”, I would add the word “observed” to avoid any misunderstanding, “in the legend together with the observed inundation distance (I) and runup (R)” \*\*\* ANSWER \*\*\* Correct remark, the word “observed” has been added in the figure caption.

p13 line 7: It seems that the eastern most extreme is reached after 40s (i.e. T180), although it depends on where you put the limit for eastern extreme. \*\*\* ANSWER \*\*\* Ok, changed (Page 12, Lines 19-20).

p13 line 8: “Contemporarily” consider at the same time instead. \*\*\* ANSWER \*\*\* Done (Page 12, Line 21).

p13 line16: consider illustrated instead of “reported” \*\*\* ANSWER \*\*\* Changed (Page 13, Line 7).

p13 line 17: “(#1)” consider (#1 figure 5) instead. Is this point #1? It is not clear. \*\*\* ANSWER \*\*\* Indeed, it's Grid 2. Fixed.

p14 lines 3-9: Some refinement in English language will improve the text. \*\*\* ANSWER \*\*\* Done.

p14 lines 11-18: Some refinement in English language will improve the text. \*\*\* ANSWER \*\*\* Done.

p14 line 21: “agents” consider factors instead \*\*\* ANSWER \*\*\* “agents” refers to atmospheric manifestations (rain, wind, storms and so on), that are usually denoted with this word.

p14 line 22: “Basing” consider Based instead \*\*\* ANSWER \*\*\* Done

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p15 line 5: “The correction done is shown in green-blue when negative (meaning “digging” with respect to the present ground level) and in yellow-red when positive, meaning increased ground elevation.” Some refinement in English language will improve the text. \*\*\* ANSWER \*\*\* Done

p16 line2: “reported” consider shows or illustrates instead. \*\*\* ANSWER \*\*\* Done

p16 line7 : “The most relevant changes regard the area between the north-east corner of Pantano Piccolo and the Torre Bianca site, where a 1 to 5 m surface layer of ground has been removed.” Consider “The most relevant change regarding the area between the north-east corner of Pantano Piccolo and the Torre Bianca site is the removal of 1 to 5 m of surface ground layer. \*\*\* ANSWER \*\*\* Done

p16 line 11: “agents” consider factors instead \*\*\* ANSWER \*\*\* Same as above

p17 line2: “filed” consider frame instead \*\*\* ANSWER \*\*\* Ok

p17 line 10: “chief” consider main instead \*\*\* ANSWER \*\*\* Ok

p19 line 4: “outside” consider besides instead \*\*\* ANSWER \*\*\* Ok

Please also note the supplement to this comment:

<https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2019-94/nhess-2019-94-AC1-supplement.pdf>

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Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2019-94>, 2019.

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