

Interactive comment on “Landslides, floods and sinkholes in a karst environment: the 1–6 September 2014 Gargano event, southern Italy” by Maria Elena Martinotti et al.

Anonymous Referee #1

Received and published: 29 November 2016

Review of the manuscript “Landslides, floods and sinkholes in a karst environment: the 1-6 September 2014 Gargano event, southern Italy”

By Maria Elena Martinotti, Luca Pisano, Ivan Marchesini, Mauro Rossi, Silvia Peruccacci, Maria Teresa Brunetti, Massimo Melillo, Giuseppe Amoruso, Pierluigi Loiacono, Carmela Vennari, Giovanna Vessia, Maria Trabace, Mario Parise, Fausto Guzzetti

General Comments The manuscript of Martinotti and co-authors entitled “Landslides, floods and sinkholes in a karst environment: the 1–6 September 2014 Gargano event, southern Italy” is an interesting well-structured and well-written manuscript that addresses relevant scientific and technical questions which are within the scope of NHESS. The authors start with the monography of the hazardous event occurred in

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the Gargano Region in September 2014 and finish with the proposition of an algorithm to forecast geo-hydrological hazards. However it needs minor to moderate revisions prior to be published.

Specific Comments

1 – Authors made a very detailed analysis (1 hour time step) of the rainfall event occurred in Gargano region in September 2014, including the evaluation of the Non-Exceedance Probability, and the corresponding duration in hours. However, from the 46 inventoried landslides triggered during the event, the reasonably accurate information about the period of occurrence is only available for 9 landslides. This is a major limitation of the work. Apparently, there is discordance between the detail of the rainfall data and the landslide information.

2 – Taking into consideration comment #1, did authors consider treating the rainfall data with less detail (e.g. cumulative rainfall for each 3 or 6 hours) ?

3 – Can authors provide any information about the exceptionality of the September 2014 rainfall event? What is the estimated return period of the event?

4- Apparently, authors follow the Cruden and Varnes (1996) classification of landslides. However, it is not clear how they distinguish soil slips and soil slides, referred in page 5, line 13.

5 – Referred Landslide clusters A,B,C and D should be clearly showed, for example in figure 5.

6 – Authors verified that significant similarities exist in the temporal evolution of the metrics computed by the E-NEP algorithm. But, to which extent is this results controlled by the specific characteristics of the registered rainfall events?

7 - Looking on the period VI in Table 1, it is arguable to consider as “dry” a 11-hour period with 1.8 mm/hour rainfall intensity.

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Technical corrections

Page 4 line 23 “record available” instead of “record available to us”.

Page 4 line 25 Include a reference to figure 5 (e.g. after sinkholes). It is desirable that figure 5 is referred in text prior to figure 6.

Page 5 line 7 “the towns of Cagnano Varano and Carpino (Fig. 5)”.

Page 8 line 14 Reference to figure 2 is inadequate.

Page 8 line 17 Reference to figure 3 is inadequate.

Page 10 line 25 The reviewer would not include rock falls in the group of landslides authors are dealing with.

Page 11 line 14 “High infiltration to shallow depth in the rock mass facilitates the formation of flash floods”. This is not clear.

Figure 2 Reconsider the caption of figure 2. The area covered by images is much larger than the Gargano Promontory. I suggest using “over the central and southern Italy” instead of “in the Gargano Promontory”.

Figure 6 The caption of photo F is missing. 1-6 September instead of 11-6 September.

Figure 7 Landslide inventory map instead of Inventory map.

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., doi:10.5194/nhess-2016-310, 2016.