Natural Hazards and Earth System Sciences Discussions

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Reply on RC1

Diego Guenzi et al.

Author comment on "Brief communication: Monitoring a soft-rock coastal cliff using webcams and strain sensors" by Diego Guenzi et al., Nat. Hazards Earth Syst. Sci. Discuss., https://doi.org/10.5194/nhess-2021-155-AC1, 2021

The subject of this discussion is interesting but the scientific background is very poor.There is no bibliography about general research of processes leading to rockfall or about the precursory signs of rockfalls. The sentence l 22 "The evolution of these cliffs and their collapse is well known among the scientific community" has to be proved. Authors' work is also done by other researchers, these studies have to be quoted.

Thank you for your note: we added few more references to better explain our sentence:

1) Sansò P., Gianfreda F., Leucci G., Mastronuzzi G.: Cliff evolution and late Holocene relative sea level change along the Otranto coast (Salento peninsula, southern Apulia, Italy). J Geophys Res. 9-12:42–53, 2016

2) Adams P.N., Storlazzi C.D., Anderson R.S.: Nearshore wave-induced cyclical flexing of sea cliffs. J Geophys Res. 110(F2):F02002, 2005

3) Stephenson W., Naylor L.: Rock coast geomorphology. Geomorphology 114(1–2):1–100, 2010

4) Sunamura T.: Geomorphology of rocky coasts. Wiley & Sons, Chichester, UK; p. 1–314, 1992

5) Fazio N.L., Perrotti M., Andriani G.F., Mancini F., Rossi P., Castagnetti C., Lollino P.: A new methodological approach to assess the stability of discontinuous rocky cliffs using in-situ survey supported by UAV-based techniques and 3-D finite element model: a case study. Engineering Geology. 260:105205, 2019

l 32 : retreat rates should be given

The average retreat rate estimated in the area by means of geomorphological analysis is approximately equal to 0.10-0.15 m/year (see Lollino et al. 2021).

l 37 : what is the evolution?

Thank you: we removed the sub-sentence "geomorphological evolution and" for the sake of clarity.

l 38 : what are the fallen volumes?

In the last years, a couple of rockfall events were detected: the first one, occurred in November 2019, involved a rock volume of 300 m^3, whereas a second event in December 2020 involved a smaller volume, equal to 15-20 m^3.

l 54 : what is the precise frequency?

We have not made explicit the frequencies because we can modify them according to our

needs. Currently, videos are taken constantly (24/7) while shots from both webcams are taken every 300 seconds; Raspberry Camera shoots every half hour.

l 66 : "neighbouring" : could you be more precise because weather data could be specific to a place.
You are absolutely right: weather station is located at latitude 40°16'02.0"N and longitude 18°16'02.0"E and is at 0 m a.s.l. Its name is "Stazione 491 Melendugno" and it is 14 km as the crow flies from our monitoring site.

l 76: ICC techniques should be developed.
We have made our sentence clearer, modifying line 55/56 from "This can be achieved either manually or using artificial intelligence techniques (i.e. Image Cross-Correlation - ICC) […]" to "This can be achieved either manually or using artificial intelligence techniques (i.e. Image Change Detection) […]" and line 75/76 from "Based on such information and the application of ICC techniques […]" to "Based on such information and the application of Image Change Detection techniques […]".

l 76 : "+- 30%" : how do you calculate the error margin?
We added a reference to explain this and we modified line 76 from "[…] a volume of the collapse equal to 300 m3 ± 30% was estimated" to "[…] we estimated a volume of the collapse equal to 300 m3 ± 30% following the methods described in (Giordan et al. 2020)".
A) Giordan D., Dematteis N., Allasia P., Motta E.: Classification and kinematics of the Planpincieux Glacier break-offs using photographic time-lapse analysis. Journal of Glaciology, 66(256), 188-202, 2020

l 94 : the discussion should have perspectives of the results. There is currently very poor.
Thank you for your suggestion; since this is a brief communication we had to be very concise but, for the sake of clarity, we added a sentence on line 106: "Moreover, despite being a low-cost solution, this system demonstrated a lot of potential, especially in flexibility and adaptability, since it allows to readily estimate the volume of the fallen blocks as well as the evolving failure mechanism of the examined coastal sector and, as such, the potential evolution of the coast retreat. As a consequence, it could be easily applied to the monitoring of different coastal areas subject to rockfalls".