Response to the interactive comment of **Anonymous Referee # 2**

on "Structural and functional control of surface-patch to hillslope-scale runoff and sediment connectivity in Mediterranean-dry reclaimed slope systems" by M. Moreno de las Heras et al.

The comments of the reviewer are shown below in italics. Our responses are presented below each comment in regular font. Proposed changes in the text as a consequence of the adaptation of the paper to the referee's comments are presented between quotation marks and in italics in our responses.

General comment:

Dear authors,

I find your manuscript very useful and a very good contribution for connectivity studies. I must say I found it very well and clear written. I can only say as a very minor correction that I would reduce the conclusion because I find the current one too long and descriptive.

Congratulations!

Response to the general comment: We thank Referee # 2 for his/her very positive assessment of our study. Following the suggested changes for the conclusions, we will reduce significantly the length of this section (from 376 to 275 words), reducing also the descriptive character of the text:

"*We developed in this study a practical application of the conceptual elements of structural and functional connectivity for the analysis of surface-patch to hillslope-scale transmission of runoff and sediments in three Mediterranean-dry reclaimed mining slope systems showing different levels of long-term development of vegetation and rill networks. Our results revealed an important role of the hillslope position of vegetation patches on the distribution of potential runoff and sediment flowpaths. More critically, the rill networks emerged as key elements of structural connectivity in the slopes, providing preferential pathways that dominate the production, spatial organization and routing of the fluxes of water and sediments. On the other hand, both runoff and sediments were largely redistributed within the analysed slope systems in the absence of rill networks. The interactions between the structural connectivity of the experimental slopes and both antecedent precipitation and rainfall intensity largely controlled event functional connectivity. The results showed that rainfall intensity and, more importantly, antecedent precipitation largely increased the spatial continuity of runoff fluxes under rilled slope conditions, where active rill incision under high intensity rainfall induced large non-linear increases in hillslope-scale sediment yield.*

In sum, this study provides empirical evidence of the feasibility of using the hydrological connectivity concept for practical applications, remarking specifically its usefulness for understanding how hillslope structural elements dynamically interact with storm characteristics and rainfall conditions to generate spatially continuous runoff and sediment fluxes. Overall, our study approach of structural and functional connectivity offers a useful framework for assessing the complex links and controlling factors that regulate the generation and movement of runoff and sediments across different scales and elements of the landscape in Mediterranean-dry and other water-limited environments".