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Climate of the Past Discussions

Interactive comment on "Changes in high intensity precipitation on the Northern Apennines (Italy) as revealed by multidisciplinary data over the last 9000 years" *by* Stefano Segadelli et al.

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Dear Authors, thanks for this contribution, I hope you will find positive the next comments. I am available for any inquiry about them. best Vincenzo Picotti

General comments This is a novel dataset of peak precipitations in the mountain area of the Northern Apennines of Italy. The authors discuss a well calibrated core and compare it with part of existing data in the region. Although the topic is of paramount interest for the scientific community, and the results interesting, the manuscript is poorly written and it requires a deep reworking prior to the final publishing. A first problem is the language, that in some cases is coupled with or it enhances problems in the flow

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of the arguments. I urge the authors to polish the paper making the reasoning easier to the reader. I have tried to polish the abstract, but, in the text, I did it here and there, and I mostly highlighted some parts where the meaning was obscure. An important general scientific problem is the interpretation of the core deposits. From the map of Figure 2, the Lake Moo spill point has an elevation of 1114.2, the S1 core was drilled at 1121. The authors interpret the deposits as lacustrine until – 0.9 m. This implies a lake level at 1120 m around 200 to 60 years ago. The spill point should have incised 6 m in around 100 years. I think this is not possible, in any case I urge the authors to consider in their manuscript the relationships between the spill point and the lake level, a topic completely overlooked. In my opinion, given the young age and the elevation with respect to the spill point, it is very likely that the units 3 and 4 were formed in a subaerial environment, that is the fan environment visible today. From the point of view of the peak precipitation, this is maybe not changing much, but the sedimentological interpretation, such as the hyperpycnal flows, should be completely changed. Interbedded fine- and coarse-grain deposits is something typical of colluvial fans, where dense flows, such as debris flows and grain flows, are common, but there is always the reworking of previous deposits by running water, that winnows the matrix and brings about fine-grained intervals. I also recommend the authors not to use the categories proximal/distal to describe grain size variations in this fan or fan-delta, given they have a spatial meaning, and here the spaces are amazingly tight. Another problem is the missing correlation of pollens with the good record of the Lake del Greppo of Vescovi et al. (2010), located in a similar setting (high elevation counterslope related to deep landslide, Northern Apennines) around 100 km to the southeast. This correlation is also hampered by the author's choice to merge data of Pinus and Abies into a common group, therefore making it impossible to appreciate the decline of Pinus and the growth of Abies during the HTM. Finally, the authors announced in the text and the abstract the occurrence of 2 cores and an interesting trench. These data are not presented, only located in the Fig. 2 small version, but not reported in the Fig. 2 larger version. What is the reason for this? A trench would help a lot understanding

the sedimentary processes! On the other hand, what is the role of Table 1? Does the forest composition play any role in the story? The pollen data are not referring to it!

Specific comments

Geographic coordinates and elevation of the drilling are missing.

Fig. 1 Middle frame, graphic scale is wrong.

Fig. 2 geologic/geomorphic map: very poor! In the published 1:50000 map, the geology of the catchment is given by large olistoliths of serpentinite embedded into “Complesso di Monte Ragola” an Upper Cretaceous blocky clayshale. This latter unit is not mentioned in the map or in the text. The surficial units are not sound: the hillslopes of the Lake (beside one mapped as serpentinite bedrock) consist of two units. The first, a “detritical (it should be detrital) cover, from boulder to granule, Holocene”. Granule is not an official grain size... what does it correspond to? (valid for the colluvium too). Does granule imply mud, or should it be something larger? Is there any mud in this detritus? Second, most of this field is mapped as serpentinite in the published small-scale map. Finally, if this is detritus, where is it coming from? If not transported, then it could be the in-situ weathering of the substrate. In fact, the weathered blocky clayshales of the Complesso di Monte Ragola, when removing the fines, would make it visible on the surface only the blocks of any size, without the clay, transported toward the Lake Moo. In any case this field should not be named “detritus”, but eluvial or colluvial cover, or simply weathered bedrock, if the thickness is less than 1 m or so. The second surficial unit in Fig. 2 consists of a large field named “Complex landslide, from cobble to silt”. Again, strange there is no clay in this unit, whereas in the depression it is full of clay. In any case, does this field refer to a landslide body? Coming from where, the south? And what created this topography? Is this the original landslide topography? Or has it been subsequently eroded? The steep wall on the eastern margin of the map is steep, suggesting bedrock. I think the two fields represent the same feature: a deeply weathered bedrock, but I never was there in the field... In the northwest side of the

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depression three alluvial fans are mapped that are missing a supplying channel. This is odd: they are clearly fan and wedges of colluvium, not alluvium. Actually, given the size and the mass flow processes, also the fans mapped at the end of channels should be considered colluvial, but this is a matter of debate, therefore I could accept them mapped as they are, except for the small sign of fan to the west of the main fan: this is clearly part of the main fan and there is no feeding channel, therefore it should be cut. Finally, the classic symbol for the fan are fanning lines that should be perpendicular to the contour: in the main fan they are badly drawn. The author should better map the area.

Fig. 5 scale is missing

Fig 6 It would be interesting to have the stratigraphic units plotted in the figure, since the change in sedimentation rate at the end of unit 2 should be better placed at the unconformity.

Fig. SUP1 In the profile BB', the core S1 is wrongly reported at 22 m at depth, instead of 12.5 m. Unclear why the authors did not calibrate the profile with the core. After a simple graphic correlation, one can appreciate that the substrate starts at around 1800 m/sec, therefore providing a much simpler and more likely geometry of the substrate/sediment contact. Please reconsider your interpretation.

More specific comments on the annotated manuscript.

Literature cited

Vescovi, E., B. Ammann, C. Ravazzi,and W. Tinner. 2010 a. A new Late-glacial and Holocene record of vegetation and fire history from Lago del Greppo, northern Apennines, Italy. Vegetation History and Archaeobotany 19: 219– 233.

Please also note the supplement to this comment:
https://www.clim-past-discuss.net/cp-2019-135/cp-2019-135-RC1-supplement.pdf

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