Clim. Past Discuss., 8, C2685–C2689, 2012
www.clim-past-discuss.net/8/C2685/2012/

Climate of the Past Discussions

Interactive comment on "Multidisciplinary distinction of mass-movement and flood-induced deposits in lacustrine environments: implications for Holocene palaeohydrology and natural hazards (Lake Ledro, Southern Alps, Italy)" *by* A. Simonneau et al.

B. Wagner (Referee)

wagnerb@uni-koeln.de

Received and published: 7 December 2012

Overall, this is an interesting study, which provides some information on the generation of mass wasting deposits and flooding events in Lake Ledro, Italy. The study is very complex and can be used as a nice example for similar studies in other lakes. However, the manuscript would benefit from some distinct changes. In some parts, the manuscript is too long and needs distinct shortening. On the other hand, impor-

tant information is missing in this paper and should be added here. For example, the description of the background sedimentation and the age model must be included. Referring to already published data is not sufficient, as it is substantial for the understanding of processes and the definition of SEs.. Therefore some major revisions (and some minor) revisions are needed. One might consider splitting the manuscript into two papers, one with a focus on earthquake history and mass wasting deposits and one on the Holocene lake hydrology including catchment vegetation and flooding events. The better solution would be a complete re-structuring of the manuscript, with (i) a detailed description of the background /overall sedimentation including QOP data and a (reduced) chronology and (ii) the focus on event horizons, as promised in the title.

Some more detailed comments are given below:

Title and abstract:

Generally ok, but both would benefit from shortening.

Title suggestion: Mass-movement and flood-induced deposits in Lake Ledro, Southern Alps, Italy: implications for Holocene palaeohydrology and natural hazards

Methods:

Although the manuscript states that the chronology of the core is presented in another paper of the special issue, it is hard to follow the timing of mass movement events and flood events, if one needs to check the other paper. Therefore I strongly suggest to include at least a table with 14C ages and/or indicate ages in Fig. 3. There is no need here to discuss the ages in detail, if the chronology is reliable, so only the presentation of the data should facilitate reading significantly.

Results:

Chapter 4.1 : p3213, 12: Which event horizons? All of them?

Chapter 4.2.: It is hard to follow the chronology without having seen any data (insert

Table or add ages in Figure 3). It is also confusing that the cores according to the Methods chapter are 14.6 and 9.9 m long, but in 4. 2 is a statement that the cores "are composed of Holocene sedimentary sequences of 11.7 and 6.9 m. So what forms the lowermost part? Pre-Holocene?

The description in the onset of chapter 4.2 jumps between times and depths; reading would be easier, if you would only refer to depth (with ages in brackets or vice versa).

As the sedimentological description of the cores apparently needs to be improved in the Vanniere et al. paper (see comments for this paper in CPD), it is necessary to describe here exactly, what is “normal” Holocene sedimentation and what are SE events? How can SE events be separated from short-term climate events (e.g. 8.2 ka cooling event)? The manuscript would benefit from a little bit more detailed description of the sediment characteristics (probably also a modification of the sub-chapter title is needed).

It is not clear, why the number of dark-coloured SE is based on horizons > 1 cm, those of light-coloured SE > 1.5 cm. This also can affect the number of events in total and averages.

Last sentence: move mean grain size of dark coloured SE to the dark-coulored SE paragraph before.

Chapter 4.3: p 3215, 3-4 size of gravel is generally defined (2-63 mm), so do you mean gravel or blocks or boths? (see also page 3214, 27)

p 3215, 16 first part of the sentence should be moved into methods chapter

Discussion:

Generell: there is no need to refer to the legend of figures in the main text, so modify for example (white circles, Fig. 10) to (Fig. 10). The discussion would benefit from a bit shortening, with a clearer focus on relevant statements and would also need re-structuring (see above).

p3217, 4 ff I can′t remember that the background sedimentation was adequately described, so please add

p3217, 13-17 rewrite and make 2 sentences

p3218, 3 according to Figure 8 mass wasting deposits 2 and 3 have less than 1.5 cm thicknesses

p3218, 23 ff you state that the number of mass movement deposits increased during the last 5000 kal yr BP, likely due to or promoted by a lake level highstand. However, apparently the number of earthquakes increased (Fig. 8) and this could be the main driving factor.

p3224 ,7ff The entire paragraph is a general discussion of the QOP data, without discussing the data obtained in this study. So it should be either moved to the methods or to those paragraphs later in the text, when it is relevant in the discussion. The discussion of the Holocene changes is much too long and does not really matches with the title of the paper. Shortening of the discussion and a focus on SE is needed or better re-structuring as described above.

Figures and tables:

Figure 1 is somewhat overloaded. The figure could benefit from deleting the photos, not clear, what colours in Fig 1 B indicate, what is Thalweg?, what is grey (5-30% slope?)?

Figure 2 : indicate length of all cores in all profiles

Figure 3: 3a: Photos at the left side are too small to allow recognizing any details, enlarge (probably new figure or delete and refer to Fig 3 b and c)

Figure 6b: red squares (clay reach dark-coloured SE) need to be explained in the legend or in the figure caption.

Table 2 hard to follow the number of mass wasting deposits without having seen data.

See also comments to the missing ages or age model.

Please also note the supplement to this comment:
http://www.clim-past-discuss.net/8/C2685/2012/cpd-8-C2685-2012-supplement.pdf

---

Interactive comment on Clim. Past Discuss., 8, 3205, 2012.