Review of: "Lake Bonneville and the Wasatch Fault – new theories and new paradigms yield insights into present-day hazards in other regions of the world"

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Potential competing interests: No potential competing interests to declare.

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Fascinating story, excellent summary of previous work and interesting new hypotheses and finally a useful outlook on risks and disasters. Years of research seem to be assembled in this manuscript. It is highly appreciated that this manuscript is proposing to make a difference between the commonly regular sedimentation rates of a lake and some events (such as pops and earthquakes) with rapid sedimentation rates. This mix is often hard to grasp.

It is full of important details that are impossible to check by a reviewer. The best would be to ask one of the scientists who has worked on the topic to comment, such as for example Benson, Oviatt, ...

Although there is generally good referencing to previous work made on Lake Bonneville, there are not enough calls when mechanisms such as deposition, erosion, precipitation, earthquake and pops, are invoked.

Could you suggest a duration for each pop and subsequent bar formation (page 57)? Add, if any, example(s) of similar mechanisms observed in other lakes worldwide.

I suggest presenting Lake Bonneville geological evolution in a more global frame. For example, in the introduction, add some words on other proglacial lakes, such as those south of the Eurasian icecap, and their development and demise. Page 62: An annual pattern of water level drop expressed in the shoreline can clearly be seen along the Dead Sea shore (Middle East)., at the rate of > 1m per year. Page 67: Similarly in the Aral Sea, wind carry toxic dust picked up from the exposed lake beds.

Page 64: see Leroy et al. 2006 paper for the impact of a natural hazard on a large area and availability of emergency support (Leroy S.A.G., 2006. From natural hazard to environmental catastrophe, past and present. Quaternary International, 158-1: 4-12. dx.doi.org/10.1016/j.quaint.2006.05. 012.) This idea was inspired by Jared Diamond (UCLA).

Points of details

Homogenise ky, ka and kya that are found in your text.

kya is a mixture of the Latin form of ka (kiloannum) and the English form kyr (kiloyear). I suggest choosing between one of the latter two.

Fig. 1 provide an inset showing where Lake Bonneville is located with N. America. For the non-N. American scientists, explain in the caption what is the white line (presumably present-day lake contour).

Page 6

A call to citation at the end of a sentence is usually included in the sentence, hence the period comes after the bracketed citation: “main body of the lake” (Ibid, p. 338). As…”. Please correct throughout the manuscript.

‘Climate, the size of the lake in the Bonneville basin, and snow in the Wasatch are inexorably linked.‘ Could you precise? Do you mean the Wasatch Mountain, Fault area, Basin, ….?

Could you locate the Cache Valley on fig. 1?

Fig. 3: the mount or the mouth? of the canyon

Page 8: Bell(s) Canyon: are you going to call to a reference or say more further down?

Figure 5: add an arrow indicating the north

Page 11: “… boulders in Wasatch to track …” precise if it is Wasatch area, Basin. Mountain, …

Page 12, second line: these data (data is a plural)

When you mention for example ^{14}C data, in many cases you actually mean ^{14}C dates: … The error range on these dates are over ….. Please reconsider throughout the manuscript.

Was the Benson date at “17.0kya” a radiocarbon date? Was it calibrated?

Page 13: add references on the sedimentological traces left with surging and sloshing.

Page 13: “in contrast, a typical a cuspid-foreland V-bar “: isn’t it “a typical cuspid”?

Page 13: Replace: “flora and fauna “ by vegetation and animals. These terms are not equivalent. Check elsewhere too.

Add calls to references.

Page 13: “Date reversals in the sediments would be a common problem “ add calls to references

Page 15: ”the flood to proceeded in earnest “ => the flood proceeded in earnest

Page 16 bottom: its effective time

Page 19: “The data these researchers presented is difficult “ data … are … but do ….

Page 20: Stansbury event is very close ….

CO_2 degassing

… and the surface of the water would become …

Page 23 and elsewhere: why precise Dr for Jewell and not for other authors?

Page 25: CO_2 …. $CaCO_3$. (use subscript, check elsewhere too)

Caption of figure 13: … descriptions ~~of the~~ of their interpretations.….

Page 28: what is striated sand? Do you mean bedded?

Figure 14: what are the red isolines for?

Page 32: “period. A one-to-one correspondence” => “period, i.e. a one-to-one correspondence”

“basalt ash eruptions rises to the” => rise

Fig. 17 caption: “are the from waves” => are from the waves

Page 39: “support a 1300m elevation (41°24'3.85"N 113°42'9.98"W.” => close the brackets

Page 39: “In 2011, Godsey et al stated “The Provo shoreline ….” => et al.

Page 39: “followed by a what is interpreted” => by what

Page 40: “the Provo level at 12.6kya ^{14}C,” => 12.6^{14}C kyr

“15kya cal” => 15 cal. kyr

Same corrections elsewhere such as on page 30.

Page 43: “About the time H1 ended” => … the time the H1 Stadial ended …

Page 44: … the data … are discrete ….

“Data“ is plural word.

Please apply this correction throughout the manuscript.

Page 51: replace weather by climate

Page 55: add the year in bracket after Schide, this is especially necessary as you list 2 Schide papers

Page 56: … shorelines do not exhibit ….

Page 59: add a call to reference for the Newfoundland Mountains pops.

Page 60: remove one of the 2 comas after Miller, et al

Page 67: Singular: phenomenon (also in conclusions)

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