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Interactive comment on "Differential resilience of ancient sister lakes Ohrid and Prespa to environmental disturbances during the Late Pleistocene" *by* E. Jovanovska et al.

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The publication represents a nice example of ecological resilience, which is especially significant for long standing ancient lakes. The default notion, exemplified by diatom publications from Lakes Baikal and Titicaca (for example), is that most if not all ancient lakes exposed to global stress events were subject to mass extinctions, species introductions/evolution and radiations. From the research in Lakes Ohrid and Prespa, it is evident and significant that many minor and major environmental stress events in ancient lakes did not cause mass extinctions but knock-down events with species recovery. The simple design documents a knock-down impact after the Campanian

Ignimbrite eruption. The impact was easy to see in the figures and strongly supported in the statistics. The design and statistical analysis are concise and nicely meet the objective of the study which was to test the resilience to tolerate environmental disturbances without changing their regimes. The concurrent/ongoing Heinrich "press" event (H4) did not have an impact on the diatoms, although the sampling around the initiation and termination of the evident (Lake Ohrid: pre- 7samples, post: 3 samples; Lake Prespa: pre- 13 samples, post 3 samples) was uneven and restricted for analysis. However, the degree of the impact by the Campanian Ignimbrite eruption was substantive, well beyond any hint of an impact from the Heinrich "press" event. The use of four analytical tools to study diatom community change works well. Interpretations of the figures is sometimes broad and over-generalized (see comments below) but overall this is a sound research initiative.

Lake Ohrid In the discussion it was implied that valve densities for C. ocellata and C. fottii increased, but the relative composition decreased. This can be deceiving because the reader thinks that numbers declined (based on figs 2 and 3) when in fact numbers (DC) increased for all the prominent taxa. Clarify differences between taxa relative abundance and taxa density changes.

Lake Prespa Is there a count at 36.5? If so it cannot be seen. The DC count graph indicates a count as well as the PAM data. Move the zone boundary line so we can see the data.

Minor corrections

Introduction: 1. 16051-24; 16053-11: In the introduction there are a number of extended. compound sentences which make for difficult reading. Try to keep sentences to less than 35 words. 2. A picture of the core section including the tephra for each lake would be helpful (as a supplement figure).

Methods 3. 16055-15: Lisiecki spelling. 4. 16056-08: Expand the explanation on how the samples were treated. 5. 16058-12: Expand the explanation on how cell den-

sities were determined. 6. Documentation of the taxa with images (supplemental) or archiving the samples for possible future referencing and validation should be included.

Results 7. Diatom concentrations are replicated figs 2 & 3 versus 4. I can see why this was done, but it may not be necessary. As listed below expand on the valve density changes for the prominent taxa after the tephra event. 8. 16058-25: I cannot see 15% in fig. 2? 9. 16059-18: Tephra is light. Could it be that the increase in cell densities was also related to sediment/mass volume corrections? This would hold for both Lake Ohrid and Lake Prespa results. Related to this question what caused the fluctuations in numbers during the ODZ 2b-2d periods? I have observed this type of cyclic fluctuation in cell densities from arctic lakes after the last glaciation. I have no explanation. 10. 16060-18: The one count I see at 35.5 Ka only has C. ocellata at about 5%. 11. 16060-19: With only one or two counts it is difficult to make statements about min. and max. 12. 16077: Figure 2, it is difficult to match Fac. Planktonic and benthic titles with their associated zones. Maybe arrows or maybe put the two titles together “Fac. Plankton & benthic” in order to better align the titles with the graph. 13. 16077&16078: Figures 2 & 3, Use a different colour than pink for PAM zone. The pink and red colours are similar and detract from distinguishing the features of interest. 14. 16078: Staurosirella venter. . .. . .. should be Staurosira venter, correct throughout the manuscript. 15. 16077&16078: Fig. 2 & 3 the % symbols with no numeric labels along the x-axis can be removed. Think about adding 10 % values on the graphs along this axis. 16. 16077&16078: Label. . ... g ash free dry weight, text is very small, maybe exclude from the label and include in the legend.

Discussion 17. 16062-16: this sentence is repeating the results. Modify or remove. 18. 16062-18: This is the first time MIS 3 has been mentioned. This could be further defined/outlined in the Introduction or here. 19. 16063-03: In Sulpizio et al. 2010, EDS data in the upper levels of the core would suggest that P levels were not altered that much during tephra events (?). If this is true, then P and possibly N were not significant. However the presence of A. formosa (in low numbers) does suggest P

levels were changing? I would suggest adding more about the P and Si data from Sulpizio et al. paper in here. Your data is better than Barker et al. with respect to diatom proxies for TP. Limit the referencing to Barker et al. since they do not develop proxies for P & N. 20. 16064-08: Prespa and Ohrid had the same % SiO2 tephra composition. I would add (either here or possibly in the methods) that you had similar "chemical" tephra compositions between the two lakes and reference Sulpizio et al. 2010. This further supports the idea that both lakes received the same impact. 21. 16064-10: Since Barker et al. (2003) does not present chemistry/geochemistry data, but inference results for Conductivity and pH, I would suggest not using this reference to account for SI/P results. 22. 16064-16: The smaller graph interval is 50 years, not decades. 23. 16064-17: Benthic diatoms also "tended" to have an initial delay in response recovery but for a shorter period of time, which supports your argument of substratum availability. This might be worth adding. 24. 16064-20: Be careful with your interpretation here. A. formosa was present but only in low relative abundance and mainly in PDZ 2b, well after ash deposition. 25. 16064-26: Fig. 3 suggests that "recovery" of the benthics occurred in PZD 2a? Maybe stick to the planktonic forms for your discussion on return to pre-disturbance or use the MDS/PAM results. 26. Addition minor comments and suggested sentence format changes are found on the manuscript.

Please also note the supplement to this comment:
http://www.biogeosciences-discuss.net/12/C7538/2015/bgd-12-C7538-2015-supplement.pdf

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