

## ***Interactive comment on “Climate, people, fire and vegetation: new insights into vegetation dynamics in the Eastern Mediterranean since the 1st century AD” by J. Bakker et al.***

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A very interesting and useful paper that reports important data on environmental and landscape change associated with post-BO Phase events in southwest Turkey; a period for which very little, ‘robust’ palaeoecological data exist for this region despite a growing awareness within the archaeological community for reduced, although continuous occupation of the region during the 7th C AD dark age. The paper builds upon the useful bioclimate reconstructions presented elsewhere (Bakker et al., 2012; Numerically-derived evidence for late Holocene climate change and its impact on human presence in the southwest Taurus Mountains, Turkey, *The Holocene*, 22, 425–438)

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and the present study provides informative data on vegetation dynamics and fire histories and examines the drivers and triggers for environmental and landscape change for 2 sites in this region. In view of the fact that parts of the paper rely upon charcoal data as a proxy for fire as a local or regional driver of environmental and landscape change, I would have liked to have seen continuous and contiguous charcoal counts rather than interval charcoal counts from pollen slides as reported in the paper's methodology. The use of interval charcoal counts from pollen slides could potentially mean that some fire events have been missed and, more importantly some of the studied pollen levels may have responded to these 'missed' fire events. Therefore, the authors are not availing themselves of the full range of evidence. I read this section at least twice in order to ascertain the exact charcoal methodology – perhaps this point is in need of greater clarification by the authors and if appropriate, the above caveat highlighted. I quite liked the comparison of the evidence of climate change alongside the evidence for vegetation and landscape change, although I was a little disappointed with one instance when the climatic explanations were not as solid or robust, then socio-economic and political drivers were invoked to account for such change. Considering socio-economic and political drivers to be subsidiary to climate drivers risks the paper being labelled as environmental or deterministic in its philosophical approach and I believe that the authors need to exercise caution in this respect. There is no reason why socio-economic and political drivers cannot act in concert with climatic drivers (a probabilistic approach); as it would appear with respect to the environmental and landscape changes that occurred during the 7th C AD as the authors outline in their concluding section. Disentangling and elucidating competing hypotheses such as these is now the focus for many high resolution palaeoecological enquiries such as the one presented in this study, and in this respect, this paper is very informative. Indeed, the future of such research relies upon interdisciplinary collaboration between palaeoecologists, historians and archaeologists. As the authors point out, these results now need to be tested at other regions of Turkey.

Several minor comments and typos: p. 3380; line 14: “accurately” – choose another  
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word (e.g., “respond remarkably fast”?) p. 3380; line 25: Rephrase... “Pollen data reveal that the old model of an abrupt and marked increase in Pinus. . .” p. 3380; line 27: Suggest use “tenable” rather than “accurate” p. 3382; line 21: “The data are supported. . .” p. 3382; line 25: “two” rather than “multiple” p. 3384; line 11: italics for “Scirpus lacustris” p. 3386; line 14: “was drilled. . .” p. 3387; line 7 & 9: “dating” p. 3387; line 25: “. . .caused by changes. . .” p. 3387; line 27: page nos required for a direct quote. Suggest rephrase without quotation marks p. 3388; lines 5-10: Would be interesting to see magnetic susceptibility data and Glomus plotted alongside SAR data. p. 3388; line 20: Need to clarify if using SAR (mm or cm y-1) or deposition time (y cm or mm-1) p. 3389; line 13: use the term “dendrogram” rather than “tree diagram” p. 3390; line 17: If charcoal was counted/analysed from pollen slides and mean sampling interval for pollen is reported, then it can be assumed that the charcoal sampling interval is the same?!?! p. 3391; line 13: use “ages” rather than “dates” p. 3391; line 19-20: “. . .and was subsequently omitted from the age-depth. . .” p. 3392; line 1: Unsure what you mean by “global” p. 3392; line 14: “. . .and are therefore omitted from the age-depth. . .” p. 3392; line 19: “. . .to the upper region of the Aykirdah. . .” p. 3392; line 20: “. . .valley was caused. . .” p. 3392; line 22: “light grey softer. . .” p. 3393; line 8: Unsure what you mean by “global” p. 3395; line 5: “. . .it is clear. . .” p. 3393; line 17: “Pollen percentage data. . .” p. 3393; line 23: Can you state what type of Asteraceae? p. 3397; line 5-6: “. . .layer reveals the presence of leaves and buds of Salix as. . .” p. 3397; line 10: italics for Butomus umbellatus p. 3397; line 20: “It is interesting to note that the increase in moisture availability observed in the regional pollen data is not. . .” It would be good to contextualise this statement more with reference to other studies that report climatic data for SW Turkey and Turkey more widely alongside your results. At the very least a reference/references is/are required for the sentence reported here. p. 3397; line 25: Lower case for “cereals” p. 3398; line 1: “. . .records, pollen spectra quickly become. . .” p. 3398; line 4: “In Gravgaz, \_\_\_??\_ continues. . .” What does? (missing text) p. 3398; line 23: “different for both. . .” p. 3399; line 17: “authigenic” p. 3399; line 28: “drier” p. 3400; line 2: “AD” p. 3400; line 4: “. . .tree ring data for May-June

precipitation which suggest that reconstruction...” p. 3400; line 28: “drier” p. 3402; line 15: “...cultivation at both sites, and a shift...” p. 3402; line 25-...: If Empire-wide, why would this not affect other sites as well? p. 3404; line 18: Insert “AD” p. 3405; line 20: “...place at other locations...” p. 3406; line 9: “Pollen and lithological data of the present study...” p. 3406; line 16: “...of poor pollen preservation...” p. 3406; line 21: “signs of poor pollen...” p. 3406; line 24: “...vegetation prior to the onset of...” p. 3406; line 28: “...soils covering the hillsides and slopes.” Reference for this... p. 3407; line 9: “...conditions, suggested by Bakker et al. (2012) to be a regional expression...” p. 3408; line 8: Eastwood et al. (2009) p. 3408; line 21: The term “Seljuk” is reserved for the Seljuk Turks (Selçuk being a city in western Anatolia) p. 3408; line 29: “...and the arrival/appearance of the...” p. 3409; line 2: “...indicates continued occupation during...” p. 3409; line 17: “...nobility were granted...” p. 3410; line 1-2: “However, the Gravgaz lithological data indicate locally drier conditions occurred earlier; that is from the early 13th century AD, while at Bereket, they occurred from...” p. 3410; line 4: “...which indicate that...” p. 3410; line 5: “...in their tree ring data occurred 1195-1264 AD...” p. 3410; line 7: “...by extremely drier climatic conditions...” p. 3410; line 12: Insert “AD” before “640” p. 3410; line 14: “...be detected in the pollen signal...” p. 3410; line 15: “...data lags behind...” p. 3410; line 21: “...signal is valid, this would mean...” p. 3410; line 28: “...data indicate that...” p. 3410; line 29: “...Ottomans, consolidated their territories, was...” p. 3411; line 1: “Eastwood et al., 2009) p. 3411; line 17-18: “...data indicate severe local drought conditions coinciding...” p. 3411; line 22: “...data indicate...” p. 3411; line 28: “...to establish the local...” p. 3412; line 22: “The number of...” p. 3414; line 14: “...bark and it can grow...” p. 3414; line 16 and 18: “brutia” with a lower case “b” p. 3419; line 6: “present” p. 3428; line 14: “Quaternary” p. 3437; Figure 2: Would be good to see these data plotted on an age scale (rather than depth) p. 3438; Figure 3: Would be good to see these data plotted on an age scale (rather than depth) p. 3440; Figure 5: Would be good to see these data plotted on an age scale (rather than depth) p. 3441; Figure 6: Would be good to see these data plotted on an age scale (rather than depth)

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