

## ***Interactive comment on “Impacts of climate and humans on the vegetation in NW Turkey: palynological insights from Lake Iznik since the Last Glacial” by A. Miebach et al.***

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Dear anonymous referee,

Thank you very much for reviewing our manuscript. We considered all of your comments and we appreciate your general positive evaluation of our manuscript.

Your main concern is that the topic of this paper does not fit the scope of the journal. We cannot approve this concern. Vegetation is an important feedback and climate system component. We studied processes in the vegetation in relation to past climate and revealed impacts of climate on the vegetation. We present a new and detailed pollen

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analysis, which is the best method to do continuous and quantitative reconstructions of past vegetation. Vegetation reconstructions are one of the most important tools to reconstruct past climates. Our data show that even small changes in the pollen assemblage of Lake Iznik can be correlated with changes of the North Atlantic circulation. The study gives insights into the strength and manifestation of climatic changes in northwestern Turkey and fills a regional gap. Climatic thresholds for tree growth are discussed and the accuracy of pollen for climatic inferences during times of human activities are evaluated. However, we assume that the editor already considered these factors while admitting the manuscript for the open discussion.

In the following, we respond to your specific comments:

“- page 5164, line 15 “The composite profiles IZN05/SC4E&LC1 and IZN09/LC2&LC3 could be clearly correlated through Ca=Ti ratios”. I think that a figure showing the XRF data for correlating the different sections along with the position of the dates (both <sup>14</sup>C and tephra) would be helpful for evaluating the robustness of the chronology of the three composite profiles.”

We clarified the concerning paragraph, and we better indicated where the correlation has been published. Moreover, we added the radiocarbon dates and tephra positions to the main pollen diagram (figure 4; see also review of L. Sadori).

“- What is the significance of aquatic plants in these corings which are retrieved in the middle of the Marmara sea?”

We didn't show any data of aquatic plants from Marmara Sea. Therefore, we assume that you meant Lake Iznik instead of Marmara Sea. Pollen of aquatic plants from Lake Iznik are rare and not diverse compared to terrestrial pollen. Relative changes might refer to local limnological changes, such as water temperature variations or changes in the nutrient supply. For our scientific questions, their significance is limited.

“- Dinoflagellates are used in the interpretation/discussion but there is no figure that

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shows their countings/proportions in the composite record? Have they been published elsewhere, if so then please cite.”

The dinoflagellate data have not been published elsewhere. Figure 5 shows the dinoflagellate data in the composite record of Lake Iznik. The raw data will also be published together with pollen data on the PANGAEA database.

“- page 5167, line 12: "These rapid vegetation changes can be correlated to Dansgaard–Oeschger (DO) events DO-4 and DO-3". Actually, figure 6 shows a rather mismatch between the pollen data and the NGRIP 18O record." Please compare page 5168, line 18-25: "A temporal offset of the Lake Iznik record is recognized by comparing it to the NGRIP  $\delta^{18}\text{O}$  record (NGRIP members, 2004; Fig. 6) and the isotopic record from the well-dated Sofular Cave in northern Anatolia (Fleitmann et al., 2009; Fig. 6). Fleitmann et al. (2009) already described an age difference for the onset of DO-4 and DO-3 of the Sofular Cave compared to the NGRIP data of 586 and 277 years, respectively. The temporal offset of Lake Iznik's record is even larger. Although timing and amplitude of climate changes and its impact on vegetation can differ from region to region, slight inaccuracies in the lower part of the current age-depth model for Lake Iznik are likely.”

The dates older than the Y2 tephra are from bulk organic and are therefore subjected to reservoir effects. Thus, a litho- and biostratigraphic correlation is preferred here. Roeser 2014 already identified and described different DO events based on multi proxy analyses (geochemistry, mineralogy, grain size). Our observations complement and confirm former results.

“- page 5169, line 27: "Peaking values of the magnetic susceptibility are ascribed to the deposition of the Y2 tephra" that is dated at about 22ka but there is an even more marked peak between 12ka and 13ka (figure 5). Does this peak also correspond to a tephra layer?”

The peak in the magnetic susceptibility corresponds to an iron monosulfides layer.

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Please compare page 5173, line 20-23: "A 2 cm thick layer of coarse sediments possibly represents a timely coincident distal deposition of a mass movement. This coarser layer is overprinted by iron monosulfides expressed by a peak in the magnetic susceptibility (Roeser et al., 2012; Fig. 5)."

Kind regards,

A. Miebach on behalf of all co-authors

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Interactive comment on *Clim. Past Discuss.*, 11, 5157, 2015.

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