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Interactive comment on “Vegetation history of Central Chukotka deduced from permafrost paleoenvironmental records of the El'gygytgyn Impact Crater” by A. A. Andreev et al.

Anonymous Referee #1

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General Comments:

Andreev et al.'s paper on pollen and testate amoeba records from terrestrial sections adjacent to Lake El'gygytgyn (Lake E) provide a vegetation and environmental reconstruction that complements existing records from the lake itself. As the authors note, long-distance transport of pollen grains from far outside the watershed is a difficulty with pollen analysis, particularly in areas that have relatively low local pollen production, such as the tundra. Their terrestrial records were able to discern short-lived vegetation and climatic events, such as the Younger Dryas, which only sometimes is recorded in lake records. This is partly because of the problems of long-distance pollen overwhelm-

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ing the local signal in lake records, but also because terrestrial deposits can have a fast sedimentation rate, so that short-lived events are more easily recognized. Finally, the presence of larch macrofossils during the early Holocene is a coup for the researchers as this is clear-cut evidence of a substantial tree-line shift during the Holocene Thermal Maximum.

My main substantive criticism of the paper is much of the discussion focuses on comparisons with Matrosova, 2009, an analysis of core LZ-1024 from the center of the Lake E basin. This reference is not easily obtained outside of Russia, (at least not through the internet), so the reader cannot judge how the records compare to each other. I noticed this particularly with the undated core 5011-3, where Andreev et al. assert that PZ-1 could date to MIS 7, based on similarities with zone E-14 in core LZ-1024. It would be good to know how PZ-1 compares with core PG-1351 which was published in the western literature (Lozhkin et al., 2007) and is easily accessed. This is not to say that PZ-1 shouldn't be linked with MIS 7, only that the reader has no basis to judge the validity of the comparison with LZ-1024.

A second comment is the authors are not always consistent on what does constitute long-distance transport, and what does not. I noticed this mainly with the larch pollen signal. Larch grains, because they are fragile and non-descript, are wildly undercounted in pollen records. So the question is—how much of the larch is local, and how much is long-distance? I would have thought that larch, because of the preservation issues, would have been mainly local. However, Andreev et al. consider larch both local (PZ-1 of core 5011-3) and long-distant (PZ-V of core P1 [see bottom of p 1416]). This is not to say that larch couldn't be both local and long-distant, but an explanation of this would be nice.

This is a nice paper; I recommend publishing with minor revisions (see the attached pdf for awkward syntax and occasional typos).

Lozhkin, A. V., Anderson, P. M., Matrosova, T. V., and Minyuk, P. S.: The pollen record

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from El'gygytgyn Lake: implications for vegetation and climate histories of Northern Chukotka since the late middle Pleistocene, *J. Paleolim.*, 37, 135–153, 2007.

Matrosova, T. V.: Vegetation and climate change in Northern Chukotka during the last 350 ka(basing on lacustrine pollen records from El'gygytgyn Lake, *Vestnik FEB RAS*, 2, 23–30, 2009 (in Russian).

Please also note the supplement to this comment:

<http://www.clim-past-discuss.net/8/C537/2012/cpd-8-C537-2012-supplement.pdf>

Interactive comment on *Clim. Past Discuss.*, 8, 1409, 2012.

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