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# *Interactive comment on* "Modelling forest lines and forest distribution patterns with remote sensing data in a mountainous region of semi-arid Central Asia" *by* M. Klinge et al.

**Anonymous Referee #3**

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This manuscript provides a compelling, detailed analysis of actual versus predicted forest distribution patterns in central Asia based on satellite data and GIS analysis of topographic and climatic variables. The primary information that is lacking in this manuscript is methodological detail on the satellite classification process and reporting on the associated error. Since the actual forest area, as determined by satellite classification, is at the root of the entire analysis, the omission of error reporting is an oversight, since single date image classification is impossible without significant error. How were the training data collected? Were the classes simply forest v. non-forest? What were the errors of omission and commission? What are the implications of these errors on the determination of forest distribution patterns/area? These are important



considerations that should be addressed. Other comments, largely cosmetic, follow:

Abstract: Line 5: Suggest changing "relation" to "relationship". Line 12: Define a.s.l. at first instance. Line 13: Unclear what is meant by "takes the same course."

Introduction: Page 14669: Line 4: Suggest changing "climatically" to "climatic". Line 10: Suggest removing hyphen between Landsat and data. Line 11: Define SRTM acronym at first instance, and remove hyphen between SRTM and data. Line 20: Suggest changing "prehistorically" to "prehistoric". Lines 19-21: I agree that generally speaking the AFA is a minimum condition of the PFA, but there are notable exceptions to this rule, when the AFA is in fact greater than the PFA, due to forest management, forest encroachment, afforestation, etc... Line 22: Suggest changing sentence to read that "tree growth is mostly restricted BY topography parameters" as opposed to "to topography parameters." Page 14670: Line 16: Suggest changing "thermal" to "thermally". Page 14672: Lines 8-9: Unclear the meaning of this sentence. Perhaps a word is missing? What is meant by "a transfer?" Lines 10-11: Suggest changing "pre-historically" to "prehistoric." Line 23: Suggest changing "until" to "even."

Study area: Figure 1: Why was this detailed study area selected? Please provide some context for this study area selection? Page 14673: Lines 9-10: "Main cities are Shonzy and Kegen." This is not a complete sentence. Suggest: "The main cities in the region are ...." Line 16: Unclear what a "planation surface" is. Perhaps there is a more common term for this? Page 14674: Line 11: Change "Mai" to "May"; Unclear what is meant by "subordinate" in September. Does this mean that the precipitation minima occurs in Sept?

Methods: Page 14675: Line 18: Capitalize "Bing" How was the accuracy assessment conducted? Was there a formal sampling protocol/accuracy assessment of the Landsat classification based on imagery? If so, what were the results? Line 23: Change 90 to 90 m to 90 m x 90 m for consistency with previous scale reference. Page 14676: Lines 8-9: If 99% of the frequency distribution of the elevation parameter was used to

delineate PFA, why does Figure 4a (the top panel with elevation) not depict the light versus dark green?

Results: Page 14678: Lines 12-14: I'm not sure that I follow the logic that the shallow left slope of the elevation parameter distribution is an indication of human impact. Wouldn't it be more plausible to suggest that a steep drop on the left side of this distribution would reflect something other than a biophysical driver?

Discussion and Conclusions: Page 14681: Line 25: Not clear what is meant by the term "luv-side". Please clarify. Page 14682: Lines 16-17: The wording of this sentence implies that human impacts influence the elevation parameter. Clearly, this is not the case. Suggest rewording the sentence to imply that human impacts are most easily recognized by evaluation of the elevation parameter, or something along those lines.

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Interactive comment on Biogeosciences Discuss., 11, 14667, 2014.