

Interactive comment on “Environmental Conditions for Alternative Tree Cover States in High Latitudes” by Beniamino Abis and Victor Brovkin

Anonymous Referee #3

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Comments on BG-2016-401 Title: Environmental Conditions for Alternative Tree Cover States in High Latitudes Author(s): Beniamino Abis and Victor Brovkin

The paper analyzes the impact of eight environmental variables (EVs) on tree cover fraction distribution (TCF) using generalized additive models, conditional histograms and phase-space analysis. Authors found that minimum temperatures and growing degree days were the most influential environmental variables for the boreal TCF distribution. The relationships between tree cover and EVs were different within the four boreal regions. Generally, the paper is well written and addresses relevant scientific questions within the scope of Biogeosciences, and could contribute to the understandings of species distribution in boreal region in response to climate change. However, I

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have few minor comments as listed below.

1. Please add citations to the sentence ‘...and to ecosystems exhibiting potential alternative tree cover states under the same environmental conditions...’ on Page 2 Line 5.
2. Table 2,4 contains many acronyms without complete name in the table caption. The figures or tables should stand alone. Suggest to add complete names to table captions or to the table. What do you mean by ‘very low, medium low, very high and medium high’ in Table 4? Please quantify or specify them.
3. The results or findings in abstract are too general, e.g. “we find that environmental conditions exert a strong control”, “we find that the relationship between tree cover and environment is different within the four boreal regions. . . .”, and etc. Please be specific.
4. Conclusions (line 2-29 on page 15) are too long, more like summary. Please shorten this section.

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