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Interactive comment on "Relationship of Permafrost Cryofacies to Varying Surface and Subsurface Terrain Conditions in the Brooks Range and foothills of Northern Alaska, USA" *by* Andrew W. Balser et al.

Anonymous Referee #2

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I have read this manuscript with great interest. I have personal knowledge of the area within the Brooks Range and foothills of northern Alaska through short visits but no research activities of my own. I think I learnt a lot from this interesting paper. The authors investigate and discuss the relationships between terrain, vegetation and permafrost using an extensive set of field data from a highly representative type of sites. The relationships between permafrost and permafrost stability/instability and terrain properties are extensively investigated and discussed using a relevant multiple factor analysis. The relationships studied and discussed cover 46 well selected illustrated and described field sites. As far as I can judge the sites included in the study are well

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selected and they are representative for the area and hence give a good coverage of relationships between terrain, vegetation and permafrost and its processes and status. The discussion of this paper is a nice and valuable contribution to our knowledge about this area in a global change scenario. It is also a contribution that combine parts of field work, modelling, geocryology geomorphology, ecology and climatology etc. in a nice multidisciplinary mix. As far as I can judge the paper and its subject fit well into the CRYOSPHERE Here is my summary comment with respect to the manuscript evaluation criteria; Originality (Novelty): 1 (or 2) The area and the sites chosen together with the multidisciplinary methods are well treated and innovative and this contribution will be read with interest by the scientific community – not only geocryologists. Scientific Quality (Rigour): 1 The aims and research questions are well defined and are treated with an adequate methodology. The results are discussed in a balanced way and the aims and research questions are well met, discussed and relevant conclusions are drawn. Significance (Impact): 1 The result of the study gives new knowledge regarding ground ice type and amount and also the distribution cryostructures in relation with terrain properties and vegetation at landscape and regional scales. The results of the paper clearly contribute to a better understanding of how permafrost and permafrost terrain will response to climate changes. This is highly wanted information especially in the larger regional scale. Presentation Quality: 2 The writing is generally clear. As English is not my mother tongue I have not gone into details regarding the language. The figures and pictures submitted are of high quality 1. Does the paper address relevant scientific questions within the scope of TC? Yes 2. Does the paper present novel concepts, ideas, tools, or data? Yes 3. Are substantial conclusions reached? Yes 4. Are the scientific methods and assumptions valid and clearly outlined? Yes 5. Are the results sufficient to support the interpretations and conclusions? Yes. 6. Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)? Yes. 7. Do the authors give proper credit to related work and clearly indicate their own new/original contribution? Yes. 8. Does the title clearly reflect the contents of the paper? Yes 9. Does the ab-

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stract provide a concise and complete summary? Yes. 10. Is the overall presentation well-structured and clear? Yes. 11. Is the language fluent and precise? As far as I can judge. 12. Are mathematical formulae, symbols, abbreviations, and units correctly defined and used? Yes. 13. Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? No. Minor Changes according to the editor might be possible. 14. Are the number and quality of references appropriate? Yes 15. Is the amount and quality of supplementary material appropriate? Yes.

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