

Interactive comment on “Scenario-based climate change modelling for a regional permafrost probability model of the southern Yukon and northern British Columbia, Canada” by P. P. Bonnaventure and A. G. Lewkowicz

T. Zhang (Editor)

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Received and published: 27 February 2013

The two reviewers have provided excellent comments on the manuscript. The authors should take these comments seriously with line by line response in their reply letter. The authors have provided some preliminary response and I agree with most of their reply comments. In the revised manuscript, the authors should include all of these reply comments with a detailed reply to the editor.

My major concern is the treatment of snow cover in the manuscript for two major rea-

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sons:

1). based on IPCC AR4 and other related recent publications, winter precipitation in the next century or so will be "highly possible" (cannot recall the exact wording in IPCC AR4) increase, resulting in a short snow duration and larger snow depth. In the current modeling approach, changes in snow cover are not considered. With 30 X 30 m resolution, local factors for permafrost conditions are often critical. The authors need to justify this point or clearly state the uncertainties resulting from the shortcoming of proper treatment of snow cover.

2). BTS method: Snow cover depth is a critical variable for BTS method. How do the authors consider changes in snow cover conditions (timing and thickness) in this modeling approach in using BTS method?

It has been found that in discontinuous and sporadic permafrost regions, presence or absence of snow and changes in snow conditions may play a much more important role for permafrost and/or ground thermal regime than air temperature. I strongly encourage that the authors pay more attention in this direction in their revised manuscript.

As reviewers correctly pointed out, the authors need to provide what is NEW in this work comparing with the previous publications. The authors do not need to provide a lengthy statement of the previous work, they only need to give a short, precise one or two sentences of the summary of the previous work and what is new in this work.

Interactive comment on The Cryosphere Discuss., 6, 4517, 2012.

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