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Interactive comment on "Climatic and topographic influences on glacier distribution in the Bhutan Himalaya" *by* H. Nagai et al.

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We thank the editor for the helpful suggestion. Our manuscript will be changed substantially.

> There are major concerns regarding the PMS concept

That will be removed in the revised manuscript.

> There is too much overlap with an earlier study published the similar authors

We will focus on detail method and evaluation of our glacier outlines to avoid the repetition.

> There is some concern regarding the methodology to delineate the glaciers and the

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Interactive Discussion
Discussion Paper

debris-covered portions

How the glaciers are delineated will be explained visually, and its quality will be evaluated compared with other inventories.

> The relation to climate is too simplistic

We will remove the analysis related to climate.

> There is a lack of rigorous statistical analysis to support the results.

Basic topographic variables of the glaciers will be focused on instead of the analysis of ELA and precipitation.

> Several important studies were not considered especially with respect to debris cover

Previous papers on debris-covered glacier which reviewers introduced us will be referred in the revised manuscript. Our discussion on elevation distribution of debris-covered glaciers will be removed.

We aim to revise this manuscript to the following frame.

Temporary tittle: Comparison of glacier inventories in the Bhutan Himalaya

[Introduction]

- Introduction of present glacier inventories and their delineation methods - Introduction of the outlines of glaciers in the Bhutan Himalaya generated by Nagai et al. (2013) - Issue: The quality of the inventories in the Bhutan Himalaya is not validated. - Purpose: This study aims to compare the qualities of manual delineation (i.e. our inventory) and semi-automatic delineation (i.e. the ICIMOD inventory, GLIMS database, and the RGI), and show sensitive and insensitive variables of glacier distribution in the Bhutan Himalaya.

[Data sets]

- Description of the Bhutan Himalaya - Data and processing of ALOS PRISM/AVNIR2

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images - Data and processing of ASTER GDEM2 data

[Methods]

- Description of manual glacier delineation - Flowchart of delineation process - Figures of delineation process

[Results]

- Basic statistic and topographic variables obtained by our outlines - Characteristics of the glaciers in the Bhutan Himalaya focusing on north-to-south contrast

[Discussion]

- Quality comparison between pre-revised and revised outlines of ours. - Quality comparison between our revised inventory and other inventories - Analysis of sensitive and insensitive variables among these different inventories

[Conclusion]

- Largely different values and similar values of glacier distribution variables among the different glacier inventories

Thank you in advance for your consideration.

Interactive comment on The Cryosphere Discuss., 8, 1305, 2014.