

Interactive comment on “Review article: Inferring permafrost and permafrost thaw in the mountains of the Hindu Kush Himalaya region” by S. Gruber et al.

F. Salerno

salerno@irsa.cnr.it

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I read with pleasure the paper of Gruber et al.. I think the paper is generally well written and structured in a clear way.

I propose some minor integration:

Line3, p.3; Studies on recent climate trends from the Himalayan range are limited, and even completely absent at high elevation, At this regard, I suggest to review the recent paper of Salerno et al., 2015 related to the time series of temperature and precipitation reconstructed from seven stations located between 2660 and 5600 m a.s.l. during 1994–2013 on the southern slopes of Mt. Everest.

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Line9, p.3. The study of Shrestha et al., 1999 was updated by Kattel and Yao (2013). In western Himalaya (e.g., Bhutiyani et al., 2007; Shekhar et al., 2010), in eastern Himalaya and in the rest of India (e.g., Pal and Al-Tabbaa, 2010). At regional level, on the Tibetan Plateau, I suggest (Liu et al., 2006; Liu et al., 2009). Yang et al. (2006) in the northern part of the central Himalaya. Salerno et al., 2015 in the southern part of the central Himalaya. It is important to point out that winter trends are always found higher in the winter season. In the northern part of Himalaya the warming is observed to be influenced more markedly by the minimum temperature increase (as reported also by Pepin et al., 2015 for the region). In contrast, studies located south of the Himalayan ridge observed a prevalence of maximum increase. In this regard, Salerno et al., 2015 provide a sort of review of these studies. I think that the possible impacts on permafrost (and in general on cryosphere) in HKH are understandable if the scientific community start considering in greater detail the recent finding related to the climatic drivers of change, even if incomplete (considering the remoteness of the region), and even if sometime they do not go in the expected direction (e.g., summer increase of max temp).

Line9, p.3. In relation to the weaking of the monsoon, Salerno et al., 2015 at local scale, but with the unique existing land time series confirm an huge decreasing in the recent years. This analysis is recently confirmed also by Salerno et al., 2016 considering the behavior of glacial unconnected lakes a gridded climatic data.

Line 30, p. 6: In relation to ground temperature measurements in HKH, I suggest to review the findings of Fukui et al., 2007.

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