

Interactive comment on “Growth response of temperate mountain grasslands to inter-annual variations of snow cover duration” by P. Choler

Anonymous Referee #1

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Dear Author,

General comments:

The manuscript “Growth response of temperate mountain grasslands to inter-annual variations of snow cover duration” discusses the influence of snow and other meteorological drivers on grassland growth. This study shows the importance of the growing season length and especially autumn dynamics on yearly productivity. The manuscript was a joy to read and I have little or no comments on either methodology or the overall manuscript structure. The path analysis was new to me, and provides a refreshing (visual) way to analyze causative relationships between variables.

Although, it's my opinion that there might be room for some discussion on snow-

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removal or freeze-thaw experiments. Although the study addresses changes under current climate conditions, the author mentions potential consequences of changes in snow melt dates due to climate change. Within this context, the potential absence of snow (for part of the winter) is also a potential scenario, increasing freeze-thaw cycles. Discussing this line of research would marry the author's observational analysis with experimental work and further strengthen the manuscript. Below I attached some references potential references.

However, I'll leave including this discussion to the discretion of the author as it will only strengthen the manuscript but does not influence it's current merit.

Finally an open question for the author; given that all meteorological drivers are available why not pursue / include a modelling approach using the simple framework as presented previously (2010 Biogeosciences / Ecosystems)?

References:

Subalpine meadow flowering phenology responses to climate change: integrating experimental and gradient methods JA Dunne, J Harte, KJ Taylor - Ecological Monographs, 2003

Recurrent soil freeze–thaw cycles enhance grassland productivity J Kreyling, C Beierkuhnlein, K Pritsch. . . - New Phytologist, 2008

Interactive comment on Biogeosciences Discuss., 12, 3025, 2015.

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