

Interactive comment on “Seasonality in the alpine water logistic system on a regional basis” by D. Vanham et al.

Anonymous Referee #1

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GENERAL COMMENTS

This manuscript deals with a subject area that has practical relevance. The combination of snow regime analysis, water use and water supply questions is an interesting approach that goes beyond purely theoretical analyses. Issues of ski resort water use (especially artificial snow-making) receive increasing attention in public and scientific discussions, on the one hand because of climate change impacts, on the other hand because of the economic pressure on the Alps in general. This is relevant for HESS.

However, the paper seems to lack a clear focus, or at least this is not pointed out sufficiently. While substance exists and is organised, aims and conclusions should be

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clarified. This should involve working out and stressing the most relevant issues.

Furthermore, implications and practical use of the analysis should be discussed, at least in a general outlook. This is especially relevant with view to climate change: Is there a decrease in overnight seasonality? Is more artificial snow produced? An in a more general manner: How can the seasonality that was presented be used, what could practical consequences look like? What is the significance of the results? In its current form, the paper fails to point out its relevance.

SPECIFIC COMMENTS

Title should be re-thought: It is not clear straightaway what "the alpine water logistic system" is referring to, although the general direction can be guessed. It is also not sufficiently evident what the goal of the study is.

Abstract: could be improved, again with better focus on aims and especially on conclusions. Is the main conclusion the definition of winter and summer period as referred to in the final sentence?

Language: fluent and precise; the punctuation is rather scarce, adding more commas would facilitate immediate understanding.

Snow data and interpolation: The altitude bias in snow measurement should be discussed, for the higher altitudes are underrepresented (as in almost any gauging network in mountains).

Methodology: Commercial water use is also derived from number of inhabitants. Is commuting relevant?

Methodology: The formulas for T_{snow} and T_{tour} are introduced also on a half month-time interval, grids "SCOV6190_S" / "SCOV6190_E" on a daily basis (p2724 l14). Be clear on the time-steps used.

References: the extensive data in the Hydrological Atlas of Switzerland could be re-

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ferred to as a comparison, eg. the respective plates for low flow, snow cover and discharge regime, but also the significance of the Alps for water resources questions.

TECHNICAL CORRECTIONS

p2714 I1 rather "a" instead of "the" water logistic system?

p2714 I4 "both temporal and spatial seasonal fluctuations": no clear. difference between temporal and seasonal fluctuation? inter- or intra-annual?

p2714 I9 "optimal winter and summer period". Optimal for what? This is not clear, also throughout the text with other occurrences of "optimal ..."

p2714 I24 "...being very dependent on seasonal variation, the water demand ..." relation between sub-sentences not clear. is it a causal relation?

p2714 I7 "within the assessment of the alpine water logistic systems". What is assessed?

p2714 I14 "datasets **of** mean..."?

p2715 I5 why is "system" in brackets?

p2716 I5 "mind **that** in the Austrian..."

p2716 paragraph 1.3 make clear why low flows are considered

p2716 I21 [mm/a] is **runoff**, not specific discharge (latter would be $l / (s \text{ km}^2)$)

p2718 I19 land use statistics would be helpful (percentage of forests, rock, ...)

p2719 I21 "winter cover" is not explained sufficiently

p2720 I29 why must the study only take into account seasonal water demand? Is this compulsive, a decision of the authors or following from the analysis?

p2722 I22 rather "***Because** the..." instead of "While the..."

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p2723 I10 is 20% "neglectable"? I suggest "of minor importance"

p2724 I3 using only "SCOV6190_S" / "SCOV6190_E" instead of explicitly stating "start / end date" hinders reading flow (also at other occurrences of this grid name)

p2725 I5 what does "winter season of 0.88 to 1" mean? explain.

p2726 I26 Kan, not Kann

p2731 make clear that first two items refer to water sources#1 and third item to water sources#2

p2737 "relationship" in legend is somewhat misleading. this is rather an example from a (representative) year

p2733 indication of station altitudes would be helpful (cf. discussion of station altitude bias)

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