

Editor comments on “Estimating the snow water equivalent on glacierized high elevation areas (Forni Glacier, Italy)” by Senese et al.

Abstract

The second paragraph (starting with “The results indicate...” until “..., ranging from ± 43 mm w.e. to ± 144 mm w.e.”) needs rewriting. This part is merely a listing of numbers but does not give enough context to a reader to understand if this manuscript is of interest for them or not.

Please define the abbreviation w.e. water equivalent in the manuscript similar to the explanation of SWE.

Introduction and scientific background

I think the term “new snow” and all related terms should be defined, that also opens for the suggestions of reviewer two to further explain the method used for estimating mean new snow density values and its limitations.

(page 2, line 41 – 52) The site description seems to be accidently squeezed into two paragraphs with scientific background and review of other studies. I suggest to locate the site description behind the scientific background and your defining of the research gaps, probably even with a separate subsection title – maybe under the data and methods chapter.

(page 2, line 59-66) I don't think it is necessary to describe the DFIR with so detailed wording, rather include a picture with the relevant citation and explain why a DFIR on your site (and other comparable sites) is not possible.

Data and Methods

(page 4, line 117) The coordinates of the site seem a bit out of context here. They would fit better in a separate site description section (if you decide for that, see comment above) or either before or behind the list of instruments instead of in between.

Consider a division into subsections to better guide the reader through the different topics you touch. Your chapter includes site description, instrument descriptions, challenges with measuring principles, some mechanical solutions, and mathematical methods rather mixed.

(page 5, line 176) You are talking about a strict control. I suggest to rather use the term “quality control” – if that is what you meant. Otherwise you may describe what do you mean by strict control? Was it manual, automatic? What are your thresholds, filter methods, ...?

Results

(page 6, line 201) Please use the parentheses solely around the citation and include the number “equal to 140 kg/m³” into the sentence. Or rewrite, i.e. “The updated value of rho_newsnow is 149 kg/m³, which is similar to

(page 6, lines 206) I find it easy to misunderstand this sentence. It seems that you would need a period without data for not underestimating. Though I think, you want to say that from those periods with missing data, it becomes clear that the accumulation is underestimated and thus a complete dataset is very important? Consider rephrasing.

Discussion

I also suggest here some further division into subsections as you discuss a lot of topics. That eases the reading process and also helps you to organize your text in a more consequent manner.

(page 8, line 262). Please refer to the large deviations between the SWE values (independent of the chosen snow density) by the SR50 and the snow pit measurements in the years 2010, 2011, 2012 and 2013.

(page 8, line 276-280). Please find a more technical way to report your problems and possible solutions. Give the reader some trust that these are challenges your team can overcome.

(page 9, line 313). Please explain what you mean by inconsistent. Do you mean that the SR50 measure a random distance or the shortest distance or rather an average distance?

Conclusions

(page 11, line 401) – remove “for our limited experience in such remote areas” – I think you showed a good deal of experience with measurements in remote areas in your entire paper.