

# ***Interactive comment on “Using crowdsourced web content for informing water systems operations in snow-dominated catchments” by Matteo Giuliani et al.***

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This paper presents an approach to supplement in situ and satellite data in snow dominated watersheds by using publicly available webcam images and flickr photographs. The authors describe a complete procedure from the crawling of the images to the application of the extracted information on the regulation policy of a reservoir lake.

I enjoyed reading this paper and I concur with reviewer 1 that it deserves publication. I am also left with the feeling that the authors may have somehow eluded the limitations of their approach. The discussion should provide a more balanced analysis, e.g. by discussing the computation cost and data storage issues, the minimal amount or frequency of images to reach a stable solution in the VSI, and most importantly the steps

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that require human intervention (see specific comments marked (A) and (B) below).

I spent some time to play around with this type of data<sup>1</sup> so I can imagine the tedious work and the challenges to automatically filter, align and classify webcams or photos. I encourage the authors to distribute an open source implementation of their processing to foster the development of similar applications in other regions.

I provided below a list of points that should be clarified. I hope that the authors will find my comments useful and look forward to reading an updated version. (NB. the line numbering of the manuscript is awkward, maybe an issue with the Copernicus LaTeX style file)

Specific comments:

P02-L12: AMSR-E derived SWE is generally not considered as "accurate" in mountain regions. Please modify or provide a reference to justify.

P03-L20: I disagree that the assessment of the VSI through the Lake Como experiment is the "only viable evaluation method". There are other validation approaches, including more direct approaches like a comparison with terrestrial time lapse cameras, comparison with high resolution satellite snow maps, etc. Please clarify or remove this sentence.

P05-L19: the skyline is manually defined for a first image. Do you mean that a skyline was manually digitalized on 2000 images (see P05-L09)? If yes this should be more clearly acknowledged. (A)

P05-Eq1: symbols  $p'$  and  $\tau$  are not defined.

P05-L26: specify what is the edge detection algorithm.

P06-L09: why "cross" correlation? I would say correlation only.

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<sup>1</sup>"Using kittens to unlock photo-sharing website datasets": <http://www.cesbio.ups-tlse.fr/multitemp/?p=7317>, which is citable as a publication of the Journal of Brief Ideas, doi:10.5281/zenodo.44809 (just saying...)

P06-L11: do you define a maximum offset to reduce the computation time, and if yes, how?

P08-L21: this is unclear to me: from the edge images, how do you extract the skyline? If this algorithm works, why was it not applied to the webcam images as well? I foresee many obstacles at this step, like the confusion of cloud edges or snow patches edges with skyline edges.

P09-L05: what does "local refinement" mean? do you mean a locally varying transformation of the image? If yes specify the method.

P09-L05 (sect 2.3): here I understand that you have used a supervised classification to get the snow mask. Then I suggest to explicit the number of samples and the method to define them. (B)

P12-L07 (at the end of the page...): please indicate the number of webcam images and the number of flickr photos that were used for this experiment.

P14-Eq9: define  $r$ .

P16-L32: did you try to use the freezing level as an input to the regulation model?

P18-L05: I created an account and logged in to this website to give it a try but the alignment tool was not really working. The page was not responding when I clicked "continue". It might be a browser issue (I used Firefox 49 on MacOS).

P19-L09: I am not convinced with the potential of this method in the Atlas mountains because there are few operating webcams and probably a much lower amount of wintertime public photos than in the Alps.

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