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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Snow cover dynamics in Andean watersheds of Chile (32.0–39.5° S) during the years 2000–2013" *by* Alejandra Stehr and Mauricio Aguayo

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Regarding the scientific contribution of the paper, in Chile there are no studies which evaluated Snowcover dynamic (SCD) in watersheds through a latitudinal gradient (32° - 39.5°), which implies different climatic conditions. There is also no objective evidence of the influence of recent climatic variability in the extension of snow cover area in a wide special scale (Central- South Chile). I agree that the scientific question of the paper is not clear; we want to have a tool (MOD10A2) that allows us to analyze SCD in Chile, and get objevtive evidence of SCA changes. In that context there are very few meteorological stations and snow routes that measure snow, for example at the Biobio watershed there are none, so MODIS could be a good tool, as it is freely available.

On an improved version of the paper we can explain the research question better. The Andes mountain range (on the Chilean side) has a great oceanic effect due to the short distance between the coastal line and the mountains, unlike the northern hemisphere that has a great continental influence. This makes the isotherm 0 is higher than in the northern hemisphere; in addition the topographic features produce a great orographic effect, strongly affecting the regime of precipitation and temperatures. This causes small-scale spatial variations in weather, which is sometimes difficult to identify in satellite imagery. All the previously mention make it important to do a validation of MOD10A2, before using it for other analysis. For the research the daily product of MODIS was also tested with no good results, precisely because of all explained above. Regarding the number and elevation of ground observations, in a revised version of the manuscript we will incorporate more existing measurements, which will allow improving the conclusions. Concerning the time period that was used, they were the data we had available at that time. In case of submitting a revised manuscript we can easily incorporate the last 3 years (2014 - 2016). The referee suggest some more deep analysis of the factors that control the variability of snow cover area and duration , in this sense in a revised version it is possible to incorporate the spatial and not only the temporal analysis of the snow cover, and also an analysis of the relation between precipitation, temperature and snow cover. Regarding discussion this can be improved as suggested by the referee.

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