

**Glacier changes on Sierra Velluda massif, Chile (37°S):
mountain glaciers of an intensively-used midlatitude
landscape** by Fernandez et al.

The most valuable contribution of this paper is in reporting area changes of the 13 glaciers in this little studied region. By contrast, reported thickness changes are unconvincing. The reason, perhaps, is that horizontal coordinates can be determined more accurately than vertical coordinates, as is true with other methods such as terrestrial surveying.

The English is very much improved, although the writing could use some attention in the second part of the text. In many places values are given to more significant figures than is warranted by the data.

Some points in my earlier comments were addressed in this draft, but others were not.

Comments in the following are indicated by page and line (page,line)

(686,18) Do the authors mean that interannual changes in terminus position follow inter-annual changes in precipitation ?

Changes in thickness and therefore glacier mass will respond annually through surface mass balance processes to annual changes in climate variables, but terminus position and thus area will respond much more slowly.

(687,25) The paper should indicate whether Keller translated it to English or to Spanish.

(688,5) "glaciated" should be "glacierized"

See p 46 of *Glossary of Glacier Mass Balance and related terms* by Cogley et al. (2011) IHP-VII Technical Documents in Hydrology No. 86, IACS Contribution No. 2, UNESCO-IHP, Paris.

(689,11) Cubic convolution should be briefly described or a reference cited.

(690,25) Eqns (1,2) are still incomprehensible to me. Units of λ and ϵ are not stated, nor is the range of the summations or what assumptions are made about correlations between the various λ , between the various ϵ , or between the λ and the ϵ

(691,23) The term "map algebra" persists and is undefined.

(693,9) What 36.1% refers to is unclear.

(693,15) Is IDW error meant ?

(695,11) The two values +7.8 and -9.9 are not identified.

(695,28) That is too many significant figures.

- (697,22) See comment 712.
- (698,22) Giving the ratio of two small integers to three significant figures is excessive. Better than saying 76.9% would be to say 10 of 13.
- (699,22) There is negligible dependence of thickness change on altitude in Fig. 6. Moreover, increase of thinning with altitude is contrary to glacier behavior in other regions of the world.
- (701,28) Say where the other 38% come from. This is an interesting statement, so giving the amounts from all sources should be included.
- (702,25) Sensitivity to inter-annual climatic variability should be identified more precisely. Glacier thickness responds immediately and directly to changes in accumulation and ablation, but area and terminus position do not.
- (703,6) "descent of 27m on the side" is unclear.
- (710) Table 2 is totally incomprehensible, although the m values and km² values seem to be in constant ratio.
- (712) If the coordinates are given instead as degrees and hundredths, there would be room in Table 4 to give the aspect. For instance, 37.48°S, 71.43°W instead of 37°28'30" S, 71°25'31" W
- (713) $|0.01| < |0.0001|$ is a mathematical contradiction.
- (714) Appearance of Table 6 would be enhanced were the uncertainties 26.24 and 0.67 stated in the caption rather than being repeated in every line. It could also probably then be merged with another table.
- (719) Show the 13 letters in Tables 4-6.