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# *Interactive comment on* "Changes in Andes Mountains snow cover from MODIS data 2000–2014" *by* Freddy A. Saavedra et al.

**Anonymous Referee #1**

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The paper presents an analysis of snow cover persistence trends over the Andes Mountains based on MODIS data for the period 2000 – 2014. The trends are related to various meteorological parameters (air temperature and precipitation) and large-scale oceanic–atmospheric indices (e.g. ENSO, PDO, SAM), and are distinguished among different latitude ranges and eastern vs. western sides of the Andes Ranges. The rationale provided for the study is that snow cover area variability and trends have not been studied in detail for South America and that there is a need to document these changes.

While this seems to be reason enough to carry out a remote sensing study on changes in snow cover for this vast region, the authors do little to provide much context on the importance of the study, and I struggle to understand the value or the contribution to



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Discussion paper

the scientific literature that it makes. Of most concern is the extremely limited length of the observational dataset (only over one decade) upon which the trends are based. This is a fundamental flaw that seems to have been overlooked entirely – indeed there is no mention of the limitations of the data in this regard anywhere in the paper. Trends cannot be reliably detected and distinguished from short-term or periodic variations over such a short period, and the observed changes certainly cannot be correlated to long-term trends in meteorology or patterns of atmospheric–oceanic variation. Thus all subsequent interpretation of the results is rather meaningless. Perhaps there could have been more effort to place the short term snow cover patterns into some context by linking these to available longer-term surface observations, which could in turn be correlated with the other variables.

Unfortunately I do not see a major contribution here that warrants publication in The Cryosphere and must recommend rejection. The advice I have would be to seek to expand the analysis to include other available data sources that can better help shed insight on the longer term trends and variability, but this would beyond the scope of a major revision.

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