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Climate of the Past Discussions

Interactive comment on "Recent climate variations in Chile: constraints from borehole temperature profiles" *by* Carolyne Pickler et al.

Anonymous Referee #2

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This paper uses 31 borehole temperature depth profiles to assess temperature change in Chile since 1500 AD. Much detail is given selection process of high quality borehole temperature profile to detect plausible past temperature history and some comparison was made between the presented borehole results with other borehole temperature studies in South America, meteorological data, climate proxies, Paleoclimate Modelling Intercomparison Project (PMIP) model. Overall the paper is well written and clear. I suggest that this manuscript should be accepted if following minor revisions are made.

Specific comments

Introduction:

Introduction describes very clearly lack of paleoclimate records in Southern Hemi-

sphere compared to the Northern Hemisphere and highlighting requirements of more paleoclimate records from Southern Hemisphere as well as in South America. However, it would be worth to cite some recent works related to borehole studies from Australia i.e. Suman et al. 2017 and Suman and White, 2017 that addresses some of the drivers of paleotemperature variations in Tasmania, Australia and may have similar influence in other place of Southern Hemisphere.

Selection of borehole temperature profile:

Page 7 Line 4, "boreholes near significant topography were also rejected" is not clear. What does mean by significant topography? Specific topographic parameter i.e. slope, aspect or relief and their influence on borehole temperature data and/or temperature reconstruction should be used. Please make it clear.

Inversion:

Temperature reconstruction from northern coastal Chile (Michilla) did not show any temperature change in last 500 years. Is this supported by any other proxy results from surrounding area. If not, could you please double check 20th Century warming signal minimised by any other external driver or systematic thermal conductivity variations?

Discussion:

Please provide appendix number on Page 9 line 7

There should be more meteorological records in that region. It would be worth to compare borehole reconstruction with an average of set of surrounding meteorological records not just one station record.

Conclusion states spatial variation of paleoclimate in northern Chile but there is no discussion regarding this in Discussion section. It would be worth to discuss spatial variations with available data in Discussion section.

References:

Suman A, Dyer F, White D. 2017. Late Holocene temperature variability in Tasmania inferred from borehole temperature data. Clim. past 13:559–572. Suman A, White D. 2017. Quantifying the variability of paleotemperature fluctuations on heat flow measurements. Geothermics 67:102–113.

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