Comment on cp-2021-171

Anonymous Referee #1

Referee comment on "Do Southern Hemisphere tree rings record past volcanic events? A case study from New Zealand" by Philippa A. Higgins et al., Clim. Past Discuss., https://doi.org/10.5194/cp-2021-171-RC1, 2022

Overview

This study by Higgins et al. investigates the Southern Hemisphere (New Zealand, to be specific) tree growth response to volcanic events. In contrast to previous studies that barely found any response, this study presents evidence of clearly identified responses. The authors conducted superposed epoch analysis (SEA) on tree-ring chronologies by species and by sites, and by groups of cedar chronologies as a further analysis. With these analyses, they found that the volcanic response of the New Zealand trees could be positive, negative, and neutral, and site-related factors appear to be more important than species. Then they built temperature reconstructions based on these tree-ring chronologies, on which they conducted SEA, comparing to that of the climate model simulations. The comparison shows agreement between simulations and reconstructions, indicating that the New Zealand trees are reliable volcanism recorders.

In my opinion, these exciting results are of importance and interest to the community, and can stimulate further studies on Southern Hemisphere trees. The manuscript is overall in good quality, with a clear structure, and analyses being thorough and to the point. I have only a few minor suggestions that I list below. Once those have been addressed, I recommend the work be accepted for publication.

Details

- L28: "the" is a typo.
- Figs. 3, S1: We still need the y-axis label for chronologies.
- Fig. 5: Similar to Fig. 3, the y-axis label is missing. The x-axis label ("Years since event year") should be put under the two columns since we have a map at the upper-left corner that does not share such x-axis label.
- Figs. 6, S7, S8, S10: The x-axis label is missing.
- Figs. S2-S6: It seems that the legends are raw codes without any explanation in the caption, and it would be difficult to understand for people who's not familiar with these codes.
- L285-287: The readers will wonder why it is the case, and a pointer to the specific discussion section is needed here.
- L382: It seems that Figure 3 is the one to refer to, instead of Figure 2.
- L458-460: A pointer to Figure 7 is needed here.
- L478: "MDX" is a typo.