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Interactive comment on "Impacts of the North Atlantic Oscillation on Winter Precipitations and Storm Track Variability in Southeast Canada and Northeast US" *by* Julien Chartrand and Francesco Salvatore Rocco Pausata

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Short reply to Reviewer #1

We would like to thank Reviewer #1 for the insightful comments, which we believe, can substantially improve our manuscript. We provide this preliminary reply to clarify some of the aspects that did not fully convince the Reviewer. We feel that we are able to address all of the Reviewer's major concern, and we think this reply may provide useful information for the other reviewer(s) as well, who may have similar concerns. This reply

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Discussion paper

is not meant to be the full reply to Reviewer #1, which will be submitted after receiving all reviewers' comments.

Reviewer #1's major concern was the lack of the novelty of our study. We acknowledge that the novelty of the paper was not properly conveyed. In the revised manuscript, we will make sure to highlight the difference and the added value of our results relative to the existing literature, as well as to make the purpose of the study much clearer.

Our manuscript stands out by offering a comprehensive overview of the influence of the NAO on the winter climate of eastern North America specifically. A particularity of our study is that we used individual tracks of low-pressure systems to analyse the storm track variability throughout the North American continent and the western North Atlantic Ocean. Therefore, we clearly and explicitly show the regional anomalies in cyclogenesis and storm tracks associated with the phases of the NAO, which are then responsible for changes in precipitation and snowfall. To our knowledge, this was not performed in previous studies.

Indeed, several studies in the cited literature discussed the relationship between mean precipitation, snowfall and the NAO in similar domains of interest. The novelty in our study for these analyses is the use of recent reanalysis data instead of station data. We will however present these more briefly in the revised version, as we will focus our discussion on the more novel results. Furthermore, we will follow the reviewer #1 suggestion and in the revised manuscript we will include the analysis of extreme precipitation and snowfall to provide further novelty. We feel instead that the analysis of weather regimes would be redundant with a recently published study (Roller et al, 2016).

Finally, we will also include a more in-depth validation of our tracking algorithm including the overall climatology over a larger domain and how it tracks specific cases. As suggested, we will make direct comparisons with the tracking algorithms presented in Neu et al. (2013) using the same units.

Of course, all of the Reviewer's other comments and suggestions will be taken into account while making changes to the manuscript.

Again, we appreciate the comments of the Reviewer #1, which provided this opportunity to clarify the novelty of our study and outline the steps we will do to make improvements to our paper.

References

Neu, U., Akperov, M. G., Bellenbaum, N., Benestad, R., Blender, R., Caballero, R., et al.: IMILAST: A community effort to intercompare extratropical cyclone detection and tracking algorithms, Bulletin of the American Meteorological Society, 94(4), 529-547, doi:10.1175/bams-d-11-00154.1, 2013.

Roller, C. D., Qian, J. H., Agel, L., Barlow, M., and Moron, V.: Winter weather regimes in the northeast United States, Journal of Climate, 29(8), 2963-2980, doi:10.1175/jcli-d-15-0274.1, 2016.

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