

THE ROLE OF ATMOSPHERIC RIVERS IN THE DISTRIBUTION OF HEAVY PRECIPITATION EVENTS OVER NORTH AMERICA

Response to reviewer's comments

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This document contains responses to the review of the manuscript “The role of atmospheric rivers in the distribution of heavy precipitation events over North America”. It is an attachment to the revised version of the manuscript submitted to the Hydrology and Earth System Sciences Journal.

Every comment was addressed and is listed below along its corresponding response. Following the recommendations of the reviewer, minor changes were done. Additionally, a new figure was included in the supplementary material, Fig. S6 was corrected, and some final refinements were made in the Methods section. I would like to sincerely thank the reviewer for the work and effort put into evaluating this manuscript.

Reviewer 1.

Minor corrections:

Line 41-42: The grammar of this sentence need correcting, particularly the phrase ‘...provide nowadays the guidelines...’. I think by removing the words ‘nowadays the’, the sentence becomes much easier to read.

R/ We agree, these words were removed.

Line 90: Change ‘...were ERA5’ to ‘...where ERA5’

R/ Done.

Line 93: Good inclusion of errors associated with the data and reasoning why you have used it. I think you have left off the most important reason to use ERA5 precipitation - ERA5 provides a globally gridded, hourly precipitation product. You could adjust this sentence so that at the end it says ‘...and ultimately because it provides a globally gridded, hourly precipitation product.’

R/ The sentence has been adjusted.

Line 296-258: This wave pattern is typical of a Rossby wave train which could certainly contain previous or synchronized ARs and HPE propagating eastward. Your suspicions are valid, but this could be made more general by stating that - the wave pattern resembles a large scale midlatitude wave train that may indeed contain alternating moist and dry advection which may include a sequence of landfalling AR-HPE synchronization. Also the phrase 'climate features', isn't quite accurate here since you are considering synoptic time-scales. Instead, it could just say 'We suspect that this wave pattern resembles...'

R/ Thanks for this suggestion. We have changed this sentence.