

Authors' Response to Reviews of

Evaluation of Total Column Water Vapour Products from Satellite Observations and Reanalyses within the GEWEX Water Vapor Assessment

Tim Trent, Marc Schroeder, Shu-Peng Ho, Steffen Beirle, Ralf Bennartz, Eva Borbas, Christian Borger, Helene Brogniez, Xavier Calbet, Elisa Castelli, Gilbert P. Compo, Wesley Ebisuzaki, Ulrike Falk, Frank Fell, John Forsythe, Hans Hersbach, Misako Kachi, Shinya Kobayashi, Robert E. Kursinsk, Diego Loyola, Zhengzao Luo, Johannes K. Nielsen, Enzo Papandrea, Laurence Picon, Rene Preusker, Anthony Reale, Lei Shi, Laura Slivinski, Joao Teixeira, Tom Vonder Haar, and Thomas Wagner

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Please find below our responses to Reviewer 2, We include the original comments in black, our comments in green, and any alterations to text in blue.

I thoroughly enjoyed reviewing this manuscript. The authors work with an interesting dataset of global total column water vapour measurements from satellite observations and reanalysis within the GEWEX water vapour assessment. The evaluation was conducted through multiple approaches, some discrepancies and biases are observed, particularly in regions with complex topography or under certain meteorological conditions.

I believe that the manuscript addresses a relevant topic and includes a timely discussion. This is a well-written manuscript that only needs to undergo a few minor changes in addition to the other reviewers' comments:

Thanks for this feedback.

1. L193: please justify the reason for conducting this evaluation based on the monthly mean at $2^\circ \times 2^\circ$, since the coarse resolution may overlook some discrepancies among the datasets.

This is the common resolution from version 1 of the archive, which we retain for consistency across the archive versions.

2. L296: please briefly explain the reasons that there is a “significant disagreement” between the datasets for dry atmosphere

The observed disagreement will come from two main sources; i) either the satellite records have poor sensitivity to low column amounts of water vapour, or ii) reanalyses do not have sufficient in situ measurements to constrain them (very common in these regions). We have updated the final part of the paragraph to reflect this:

“Therefore, this highlights a significant disagreement between the archive records for dry atmospheres, especially at high latitudes. This disagreement can be driven by either low sensitivity in observational satellite records or a lack of in situ measurements to constrain reanalyses”

3. L339: missing cross-reference for the figure.

A cross-reference to Figure 2 is included now.

Thank you for taking the time to review our manuscript and your positive comments.