

Response of the authors:

The authors would like to thank the editor and the reviewers for the time they invested to review this paper. We addressed the suggested points. The current version contains all changes according to the reviewer suggestions.

Referee#2	Response of the authors
<p>ERA data, versus no clear gradient in the GNSS data. I recommend to do the ERA analysis for the same period as covered by GNSS in figure 10 c and d. It is unclear to which degree different time series are included in figure 10 c and d. From figure 8 it is clear that the large variations from year to year of the "trend component", means that differences in time extent risk leading to local variations in figure 10 c. Are there sites enough to do a "clean" figure 10 c, with all sites covering the same period? Put less emphasis on PWV from ground based meteorological measurements. Even if there is a relation, it is certainly not going to be the way in which we determine PWV variations and trends in the future.</p> <p>A few more detailed comments page 2. PWV trends are not similar in all regions, please detail if for example Bengtsson et al cover the same region as you. page 3 Specify already here the resolution of your vertical ERA profiles (when you finally give the number, you have already used the profile information several times). page 4, line 13. ..regression -> relation why not provide eq 6 and 7 already in connection with eq 5?</p> <p>page 5. When assessing the short commings of finite ERA resolution, why not also check interpolated ERA data directly at the meteorological sites for a clean answer? page 6 line 21.</p> <p>The standard error of the PWV estimate was deduced against which data? Figures: In some of the figures PWV differences are shown, but the "sign" is not mentioned. Is it $PWV_{GNSS} - PWV_{ERA}$, or vice versa?</p>	<p>Thank you for raising this question. We added figure 9, in which we estimate the trend from concurrent GNSS and ERA-Interim (over the same time window). There is a very good agreement between the two data sets with, expected, slight difference in the trend values. In space, the two data sets behave the same way.</p> <p>We agree with the reviewer on the point that this is not the best way to obtain PWV. However, external data for validation are limited; therefore, we used these data, which are significantly long and prepared for climate studies. Moreover, we evaluated the time series and found they are suitable for further analysis. Now the paper is rearranged and modified, so that this point is more understandable.</p> <p>Yes, that is right. Bengtsson et al. focused on the GPS network in Scandinavian region.</p> <p>Text added (page 3, line 26)</p> <p>Modified Just because we discussed the results of the analysis of the different parameters.</p> <p>Yes, we also checked the pressure at the meteorological sites obtaining the same results with negligible difference. Since it is important to evaluate the pressure at the GNSS, we added the results at the GNSS sites to the paper rather than the meteorological site.</p> <p>The standard error is conventionally obtained for each data set independently as given in Eq. 15</p> <p>Text added to the caption, it is ERA-Interim–GNSS.</p>