Supplementary Materials: Testing the Contribution of Stress Factors to Improve Wheat and Maize Yield Estimations Derived from Remotely-Sensed Dry Matter Productivity

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In order to support the difference/similarity between the raster data presented in the Figure 7 in the manuscript, a numerical comparison was performed and the difference maps are created. As a measure of agreement, Agreement Coefficient (AC) was calculated. It is a measure for comparison of different spatial datasets e.g., two images from different algorithms [1]. AC ranges from 0 to 1 indicating the degree of agreement from complete disagreement to complete agreement [2]. AC values computed between ε_{AR} calculated with modified DMP (this study) and CGLS-DMP is 0.53, between MODIS NPP/GPP ratio from 2000–2013 and ε_{AR} calculated with CGLS-DMP is 0.57 and between MODIS NPP/GPP ratio from 2000–2013 and ε_{AR} calculated with modified DMP (this study) is 0.91.

Figure 1 displays the difference maps. On average, the difference between ε_{AR} calculated with modified DMP (this study) and CGLS-DMP is −0.23, MODIS NPP/GPP ratio from 2000 to 2013 and ε_{AR} calculated with CGLS-DMP is −0.18 and MODIS NPP/GPP ratio from 2000 to 2013 and ε_{AR} calculated with modified DMP (this study) is 0.05.
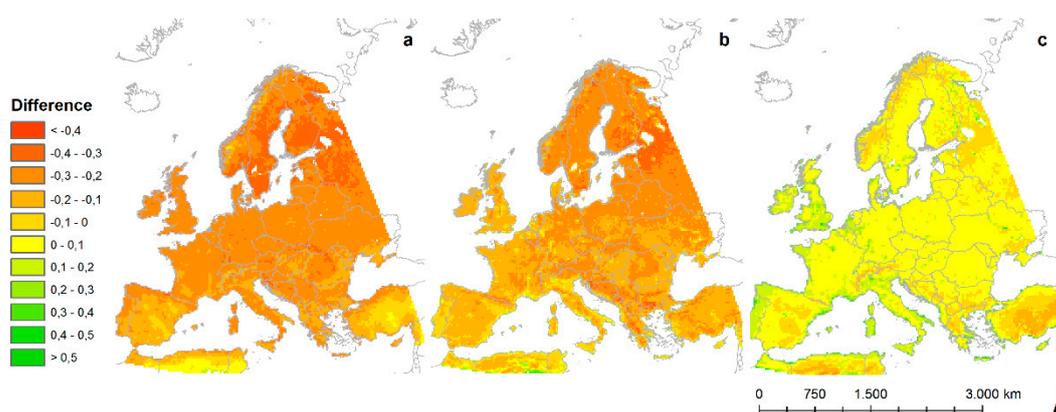
Figure 1. Difference maps of ε_{AR} calculated with modified DMP (this study) & CGLS-DMP (**a**), MODIS NPP/GPP ratio from 2000–2013 & ε_{AR} calculated with CGLS-DMP (**b**) and MODIS NPP/GPP ratio from 2000–2013 & ε_{AR} calculated with modified DMP (this study) (**c**).

The scatterplots were computed and presented in Figure 2.
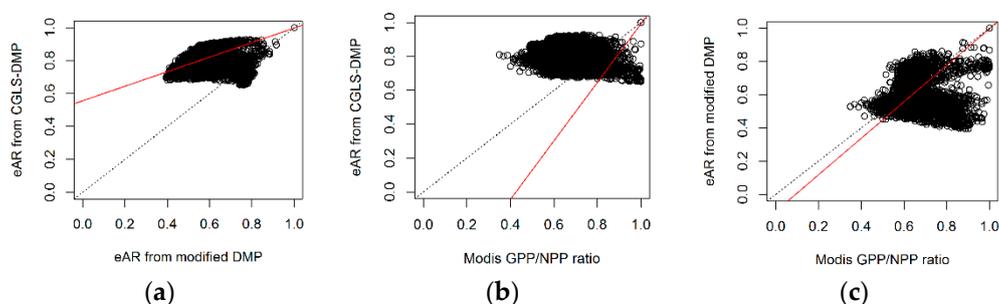
Figure 2. Scatterplots of ε_{AR} calculated with modified DMP (this study) & CGLS-DMP (**a**); MODIS NPP/GPP ratio from 2000–2013 & ε_{AR} calculated with CGLS-DMP (**b**) and MODIS NPP/GPP ratio from 2000–2013 & ε_{AR} calculated with modified DMP (this study) (**c**). The dotted lines are the 45° reference lines and the red lines are trend lines.

Comparison of numerical simulation results show that ε_{AR} calculated with modified DMP is closely related to the MODIS NPP/GPP ratio.

References

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2. Yuan, W.; Liu, S.; Yu, G.; Bonnefond, J.M.; Chen, J.; Davis, K.; Desai, A.R.; Goldstein, A.H.; Gianelle, D.; Rossi, F.; *et al*. Global Estimates of Evapotranspiration and Gross Primary Production Based on MODIS and Global Meteorology Data. *Remote Sens. Environ.* **2010**, *114*, 1416–1431.