

Supplementary materials for hess-2020-242 ‘Assessing the large-scale plant-water relations using remote sensing products in the humid subtropical Pearl River Basin in south China’

Monthly gross primary production (GPP) are obtained from MODIS (MOD17A2) (Running et al., 2004), VPM (Zhang et al., 2017) and PML (Zhang et al., 2019) where spatial differences exist (Fig. S1). The pattern between MODIS and PML is similar and differs from VPM where the latter shows much lower GPP anomalies spatially. Regardless of the differences in spatial distribution, GPP anomalies from the three sources agree well with correlation coefficient $R > 0.9$ in most pixels. Temporally, the R^2 is 0.93, 0.94 and 0.96 between MODIS and VPM, MODIS and PML, and VPM and PML, respectively.

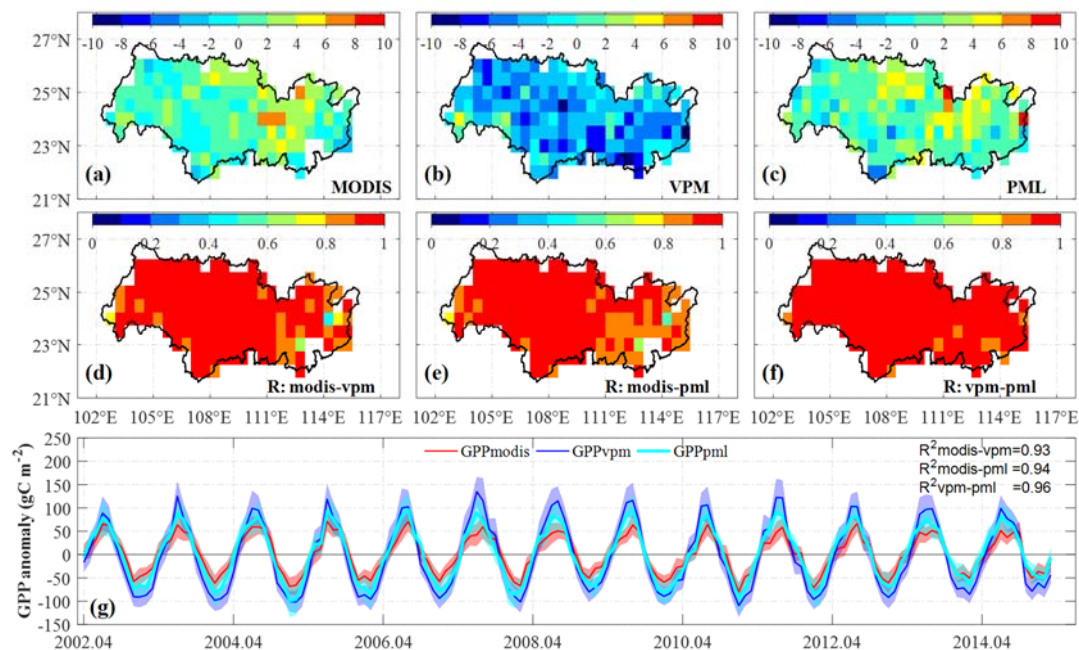


Figure S1. Comparison of monthly GPP anomaly from different sources based on different algorithms, i.e. MODIS, VPM and PML. R is the correlation coefficient between GPP from each two sources.

Fig. S2 shows the comparisons of monthly and annual GPP anomaly from MODIS, VPM and PML over the entire basin during the period of 04/2002-03/2015. It is observed that at the monthly scale GPP anomaly from MODIS is close to that from PML, whilst GPP anomaly from VPM is clearly lower than the other two, especially the median value. At the annual scale, the mean GPP anomaly is similar between

MODIS and PML and higher than that from VPM. Median value of MODIS is slightly higher than that of PML. Moreover, the data range of VPM is greater than that of MODIS and PML, which infers that VPM gives lower GPP values beyond growing seasons and higher values in growing seasons, as is shown in Fig. S1g.

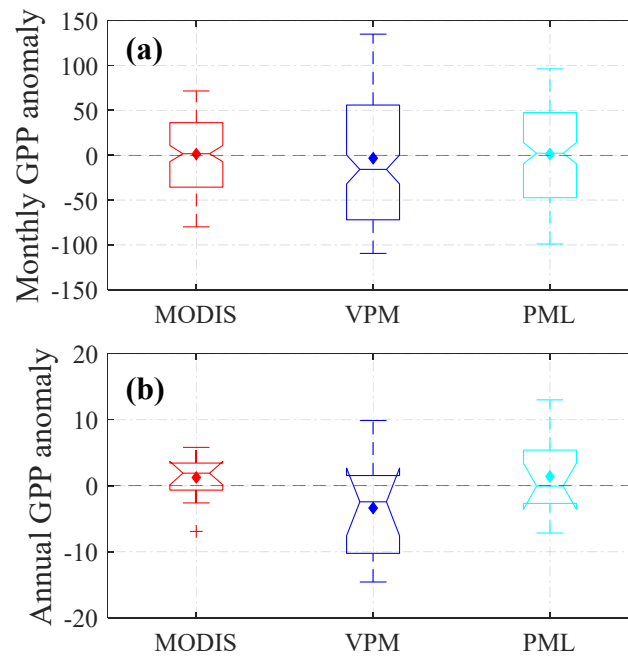


Figure S2. Comparison of mean GPP based on MODIS, VPM and PML algorithms over the entire basin. Solid diamonds mark the mean GPP of each dataset. Unit for GPP is gCm^{-2} .

These comparisons of GPP from different sources demonstrate that the GPP values from MODIS and PML are comparable and VPM might underestimate GPP. However, without ground observations in the basin to validate these datasets, it is hard to conclude which dataset is the most accurate. Despite the accuracy issue, it should be similar when analyzing spatiotemporal relationships with hydroclimate variables using MODIS and PML data.

References

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